



REGIONAL PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Strengthening resilience of vulnerable communities in Sri Lanka and India to increased impacts of climate change
Countries:	Sri Lanka and India
Thematic Focal Area:	Food security
Type of Implementing Entity:	Multilateral Implementing Entity (MIE)
Implementing Entity:	World Food Programme (WFP)
Executing Entities:	Sri Lanka: Ministry of Environment India: Ministry of Environment, Forest and Climate Change
Amount of Financing Requested:	13,995,524 (in U.S Dollars Equivalent)

A. Project Background and Context

Location and climate

The project is a regional initiative targeting dryland localities within the dry zone of Sri Lanka and the eastern coast of India. In Sri Lanka, the project will focus on districts in the dry zone,¹ while targeted areas in India will be the dry districts within the states of Odisha, Andhra Pradesh and Tamil Nadu. The targeted areas in both countries share similar climate risks, agro-ecological conditions and socio-economic vulnerabilities. Climate change impacts already affecting the project areas in Sri Lanka and India include delayed monsoon rains, increased average temperature leading to more heat stress, more variable rainfall, and increased frequency of heatwaves and droughts, which result in reduced food and water security, as well as adverse effects on human health, natural ecosystems and biodiversity.

The tropical island of **Sri Lanka**, with a land area of 62,610 square kilometres, lies south east of the Indian subcontinent (land area 2,973,190 square kilometres²), separated from the Indian state of Tamil Nadu by the Palk Strait. Altitude governs Sri Lanka's regional differences in air temperature. In the lowlands, up to an altitude of 100 to 150 m, the mean annual temperature is 27.5 degrees Celsius, while that of Nuwaraeliya, at 1800 m sea level, is 15.9 °Celsius. The north-east (NE) monsoon brings rain to the northern and eastern regions in December and January, while the western, southern and central regions of the island get rain from May to July due to the south-west (SW) monsoon.³ Sri Lanka's mean annual rainfall is 1,850 mm, ranging from 900 mm in the driest south-eastern and north-western parts, to 5,000 mm on the western slopes of the central highlands.⁴

While **India** has a variety of climate regimes, the SW monsoon (June-September) is the most important climatic feature, bringing nearly 75 percent of the annual rainfall of the country. The northeast (NE) monsoon (October-December)⁵ brings rain mainly to the southeast parts. Andhra Pradesh receives 70 percent⁶ and Odisha receives 80 percent of its rainfall during the SW monsoon,⁷ while Tamil Nadu state has a different annual rainfall distribution, with 48 percent falling during the NE monsoon, and only 32 percent through the SW monsoon.⁸

Environmental and agro-ecological conditions

Sri Lanka is the most biodiverse Asian country in terms of species density, related to its diverse topography and ecosystems. The central mountain region is surrounded by a plain, which covers over two-thirds of the land area and rises to 300 metres above mean sea level. Approximately 65 percent of the country is agricultural land, while forests cover some 28.8 percent.⁹ These include rainforests, mountain cloud forests, dry zone monsoon forests and arid thorn scrub forests. The dry zone, located on the coastal plain, lies largely within the mixed dry evergreen forest eco-region.

India has great geographic diversity, including the Himalayas in the north, the tropical wet evergreen forests in the north east and the south west, and the tropical dry thorn forests in the central and western states.

¹ Sri Lanka's Dry Zone lies across the Eastern, Northern, North-central, North-western, Central, Uva, and Southern provinces.

² Land areas taken from World Bank <https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=IN>

³ http://www.climatechange.lk/Climate_Profile.html accessed 03/02/21.

⁴ Climate Change Secretariat (2016) 'National Adaptation Plan for Climate Change Impacts in Sri Lanka 2016-2025.

⁵ http://uchai.net/pdf/knowledge_resources/Publications/Reports/Climate%20Profile%20India_IMD.pdf accessed 15 June 2021.

⁶ Andhra Pradesh State Action Plan on Climate Change, 2012.

⁷ https://imdpune.gov.in/hydrology/rainfall%20variability%20page/odisha_final.pdf accessed 15 June 2021.

⁸ Tamil Nadu State Action Plan for Climate Change

⁹ MoE (2014) National Action Programme for combatting land degradation in Sri Lanka 2015-2024.

Approximately 50 percent of the country is under crops, with 24.56 percent under forests and tree cover.¹⁰ The dryland areas targeted by the project lie inland from the eastern coast and encompass some mountainous areas of the eastern range that include forested areas. India is a recognized mega-diverse country, and it includes one of the eight Vavilovian centres of origin and diversity of crop plants, having more than 300 wild ancestors and close relatives of cultivated plants, which are still evolving under natural conditions.

These rich ecosystems in both countries are threatened by habitat loss, fragmentation and degradation, overexploitation of biological resources, loss of traditional crop and livestock varieties and breeds, pollution, deforestation, water scarcity, human/wildlife conflicts, the burgeoning spread of alien invasive species, climate change and desertification, increasing human population density, and the impact of development projects.¹¹ Reclamation of wetlands, indiscriminate use of coastal lands and landfills in wetlands also drive habitat loss. Environmental challenges are becoming more urgent in both countries, particularly in the dryland areas where land degradation, which leads to increased poverty through reduced land productivity and loss of biodiversity, is exacerbated by climate change.¹² India has one of the largest populations living on degraded land in the world. Deforestation is the most serious threat to terrestrial biodiversity in Sri Lanka, with 50% of its forest cover lost within 50 years.¹³

Socio-Economic Characteristics and Vulnerabilities

Population, economy and poverty

The South Asian region is home to 1.9 billion people, of which 1.3 billion live in India, (the second most populous country in the world), and 21.8 million reside in Sri Lanka. Sri Lanka and India are both classified as lower-middle income countries.

Sri Lanka has an average population density of 348 per square km¹⁴, and ranks 72nd out of 189 countries on the Human Development Index (HDI) (score of 0.78).¹⁵ Official statistics indicate Sri Lanka's urban population is relatively low, reportedly 19.3 percent in 2016¹⁶; however, one quarter of the population is believed to live in the metropolitan area of Colombo.¹⁷ The fertility rate was 2.2 in 2016, and the average household size is 3.8 people.¹⁸ Youth unemployment is high at 21.5 percent in 2019 (for the age group 15 – 24 years), with a higher rate for female youth (28.7 percent) than for male youth (17.6 percent). The country has made good progress on addressing poverty and development in recent decades. However, moderate poverty remains a challenge, as nearly one in four people live on USD 2.50 per day, just above the poverty line. Pockets of deeper poverty persist in the dry zone, central areas and isolated regions such as the Moneragala District and the estates (plantations). The high proportion of those employed but still living in poverty, gender disparities and scarce and unequal access to services and the labour market indicate a need for sustained and equitable economic engagement and market development in these areas.¹⁹ The Gini coefficient was 39.80 in 2016, having reached a maximum value of 41.00 in 2002 and a minimum value of 32.40 in 1990.²⁰

The economy of Sri Lanka is dominated by the service sector (61.7 percent of Gross Domestic Product [GDP] as of 2017), with major contributions from trade, transportation, and real estate activities. While the agricultural sector has shrunk in its contribution to GDP (7.8 percent as of 2017), it remains a significant employer (27 percent of the labour force in 2016).²¹ Sri Lanka is nearly self-sufficient for rice²², the major crop. Other key crops include tea, rubber, and coconut, which collectively are cultivated over an area comparable with paddy rice (ca. 600,000–700,000 ha). About 1.8 million farm families are engaged in paddy cultivation; smallholders traditionally cultivate about 0.5 ha of irrigated or rainfed paddy land, along with a small amount of fruit and vegetables and chickens, pigs, goats and cattle or buffalo, and cultivation of fish in village-level water reservoirs.²³ Food crops such as pulses, oil crops, fibre crops, other cereals, yams, vegetables, and others are grown as rotation crops, on different land to the paddy land, for household use or for sale in local markets. The agriculture and forestry sectors rely on both traditional and modern technologies; neither sector is highly mechanized.²⁴

The Dry Zone, the focus area of this project, is the agricultural heartland, covering 70 percent of the island's land area and providing many forms of agricultural employment. Two-thirds of Sri Lanka's cultivated areas are rain

¹⁰ MoEFCC (2021) 'Third Biennial Update Report to the UNFCCC'.

¹¹ <https://www.cbd.int/countries/profile/?country=in#facts> & <https://www.cbd.int/countries/profile/?country=lk#facts> accessed 28/01/2021.

¹² This is reported in several country communications to the three Rio Conventions (UNFCCC, UNCBD and UNCCD).

¹³ <https://www.cbd.int/countries/profile/?country=lk#facts> accessed 28/01/2021.

¹⁴ Sri Lanka Dept. of Census and Statistics, Statistical Abstract 2020.

¹⁵ UNDP Human Development Report 2020.

¹⁶ CBSL (2018). Economics and social statistics of Sri Lanka 2018. Central Bank of Sri Lanka.

¹⁷ Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

¹⁸ Central Bank of Sri Lanka. Socio-economic data 2018.

¹⁹ United Nations. 2017. United Nations Sustainable Development Framework 2018–2022. Colombo, United Nations System in Sri Lanka (*hereafter UNSDF*).

²⁰ World Bank Development Research Group data.

²¹ Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

²² <http://www.statistics.gov.lk/Agriculture/StaticInformation/PaddyStatistics/SelfSufficiencyInRice>

²³ ADB (2016) Sector Assessment for ANR in Sri Lanka, Country Assistance Program Evaluation.

²⁴ Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

fed or irrigated by numerous minor reservoirs and diversions, collectively referred to as village irrigation schemes; over 15,000 of these are scattered across the Dry Zone. In the south-eastern parts of the Dry Zone, the poorest households depend almost exclusively on rainfall, while in other parts paddy rice is irrigated from the system of “tanks” or minor irrigation reservoirs. Farmers grow other field crops in the ‘Yala’ season when there is less rainfall; this has become more difficult as rains become more variable / reduced. Many families already live on the verge of multidimensional poverty and struggle to pay off loans for seeds and equipment; climate change can render small-scale agriculture, home gardening, tank fisheries, and other rural income sources in the Dry Zone unprofitable, forcing women and men to either find alternative employment, fall into poverty, or move away.²⁵ Pockets of poverty and social exclusion are most prevalent in under-developed, rural districts of the Dry Zone²⁶, where rehabilitation of community assets requires further attention.

India has an average population density of 382 per square km,²⁷ and ranks 131 out of 189 countries with an HDI of 0.65. Despite steady economic growth and great success in reducing multi-dimensional poverty,²⁸ with high levels of food insecurity, and malnutrition. These broad successes have not been shared equally or benefited all Indians. Much of India’s poverty is concentrated in rural areas and in low-income states.²⁹ India remains a largely rural society, but is estimated that the urban population will increase from 31 percent of the total in 2011 to 40 percent by 2030.³⁰ The average household size of 4.2 persons shows slight variation, being 4.3 in rural India and about 3.9 in urban India.³¹ 64 percent of the population is aged 15-59 years³². The unemployment rate among rural male youth (persons of age 15-29 years) was 16.6 per cent while the unemployment rate among the rural female youth was 13.8 per cent during 2018-19.³³ At 2.2 children per woman, the country is close to achieving the replacement level of fertility.³⁴

India’s economy, now the fifth largest in the world, has become increasingly diversified and stable over the past few decades. The largest economic sector by far is services, contributing 61 percent of GDP, but employing only 25 percent of the labour force; manufacturing and industry contributes 23 percent to GDP; while agriculture accounted for 15.4 percent of GDP, and employs 53 percent of the country’s workforce.³⁵ The country has reached grain self-sufficiency. 70 percent of India’s rural households still depend primarily on agriculture for their livelihood, with 82 percent of farmers being small and marginal.³⁶

Odisha, a key focus area of this project, is one of India’s least-developed states and its eighth largest state, comprising 4.7 percent of India’s land mass, 3.37 percent of its population (some 42 million people), and over 5 percent of its poor. Although poverty levels fell from 57 percent in 2004/05 to around 33 percent in 2011/12, the proportion of poor in Odisha remains well above the national average of around 22 percent. The rapidly growing economy (above national average) and rapid urbanisation of many agglomerations too pose a challenge for addressing climate change.³⁷ The state has the largest number of Particularly Vulnerable Tribal Groups (PVTG), who are the poorest and most vulnerable of the Scheduled Tribes (STs). Andhra Pradesh is the seventh-largest state with a total area of 162,975 km² and the tenth-most populous state with 49,386,799 inhabitants, of whom approximately 23,700,000 are women, while the total population of Tamil Nadu, the eleventh largest state in the country, is 72,147,030, of whom 36,009,055 are women.³⁸

Thus, the targeted project localities in both Sri Lanka and India share similarities in socio-economic characteristics, with a strong dependence on agriculture and thus high natural resources dependency, and with pockets of poverty concentrated in the more under-developed rural districts.

Gender inequalities

Sri Lanka ranks 90 (out of 189 countries) on the 2019 Gender Inequality Index (GII), while India ranks 123.

Table 1 Gender Inequality Index³⁹

²⁵ SLYCAN Trust (2020) Climate change and human mobility in Sri Lanka. Policy brief developed for IOM.

²⁶ Such as Puttlam, Anuradhapura, Kurunegala, Polonnaruwa, Moneragala.

²⁷ 2011 Census data; http://www.dataforall.org/dashboard/censusinfoindia_pca/ accessed 03/02/21.

²⁸ NITI Aayog (2019) ‘Localising the SDGs: early lessons from India 2019’.

²⁹ NITI Aayog (2021) ‘SDG dashboard and index’.

³⁰ United Nations. 2014. World Urbanization Prospects: 2014 Revision. <https://esa.un.org/Unpd/Wup/Publications/Files/WUP2014-Report.pdf>

³¹ MoSPI (2019) ‘Periodic Labour Force Survey Annual Report, July 2017 – June 2018’.

³² MoEFCC (2019) ‘Biennial Update Report to the UNFCCC’.

³³ MoSPI (2020) Periodic Labour Force Survey, July 2018 – June 2019.

³⁴ UNFPA Country Programme for India 2018-2022.

³⁵ <https://www.investindia.gov.in/team-india-blogs/service-sector-india-paradigm-shift> accessed 03/02/21.

³⁶ FAO (2018) India Country Strategy.

³⁷ Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023.

³⁸ All population figures for Tamil Nadu are taken from the 2011 census, which is the latest conducted. <https://censusindia.gov.in/census.website/data/population-finder> last accessed 07/07/22. Figures for Andhra Pradesh taken from the MSSRF (2022) Three State Assessment report prepared for WFP India.

³⁹ <http://hdr.undp.org/en/composite/GII> accessed 02/02/2021

HDI rank	Country	Gender Inequality Index		SDG3.1	SDG3.7	SDG5.5	SDG4.4		Labour force participation rate	
		Value	Rank	Maternal mortality ratio	Adolescent birth rate	Share of seats in parliament	Population with at least some secondary education		(% ages 15 and older)	
				(deaths per 100,000 live births)	(births per 1,000 women ages 15–19)	(% held by women)	(% ages 25 and older)		Female	Male
		2019	2019	2017	2015-2020 ^b	2019	2015-2019 ^c	2015-2019 ^c	2019	2019
72	Sri Lanka	0.401	90	36	20.9	5.3	79.2	81.0	35.4	74.6
131	India	0.488	123	133 ^k	13.2	13.5	27.7 ^l	47.0 ^l	20.5	76.1

Overall life expectancy at birth in Sri Lanka is 77 years, with females having a higher life expectancy of 78.6 compared to 72 years for males (calculated between 2011 and 2013).⁴⁰ Out of the 8.6 million economically active population, 64 percent are males and only 35 percent are females. Women constitute 52 percent of Sri Lanka's population but make up only 5.3 percent of representatives in parliament. Despite Sri Lanka's achievements in human capital development that favour women, such as high levels of female education and low total fertility rates, the low female labour force participation rates persist. These are caused by a combination of household roles and responsibilities; women not acquiring the proper skills demanded by job markets; and gender bias in hiring procedures.⁴¹ Women are more likely than men to be facing multidimensional poverty and near multidimensional poverty.⁴² Gender inequalities are likely to be higher in parts of the Dry Zone, where there is a larger number of women headed households (reportedly 30 percent, compared to a national figure of 22 percent of all households),⁴³ and a greater proportion of women taking care of people with disabilities and chronic diseases (especially the high incidence of chronic kidney failure affecting male farmers in the north and north central regions).

Life expectancy at birth in India is 69.7 years, with females achieving 71.46 years and males at 68.37.⁴⁴ Females constituted 48.59 percent of the population in 2016.⁴⁵ India's rank of 123 on the GII reflects the ongoing need to improve gender equality, as women do not benefit equally in economic opportunities, or in parliamentary representation (Table 1). The increase in the literacy rate to 77.7 percent in 2017 from 72.98 percent in 2011 has not yet closed the gap between male (84.7 percent) and female (70.3 percent) literacy;⁴⁶ nor between the urban and rural areas. In the latter, the literacy rate was 80.7 per cent among males compared to 64.5 per cent among females.⁴⁷

Despite positive development gains, the project localities in Sri Lanka and India share similar characteristics with respect to gender inequalities, with women more likely than men to be poor. While at the national level Sri Lanka has a higher score on the GII, the above analysis reflects the need for more progress on gender equality in the rural districts of the Dry Zone.

External shocks: effects of the Covid-19 pandemic and economic crisis

In 2020 South Asia entered into its worst-ever recession due to the devastating impacts of COVID-19, taking a disproportionate toll on informal workers and pushing millions of South Asians into poverty. Many of the people who have been worst affected are also those who are more vulnerable to climate change – such as the rural poor who depend primarily on the climate-sensitive agricultural sector. Regional growth was expected to contract by 7.7 percent in 2020, after topping 6 percent annually in the past five years.⁴⁸ The projected rebound to 4.5 percent in 2021 will not offset the lasting economic damage caused by the pandemic; when population growth is factored in, income-per-capita in the region will remain 6 percent below 2019 estimates.⁴⁹

India's economy, the region's largest, was expected to contract by 9.6 percent in the fiscal year that started in March 2020. The GoI has reported a V-shaped recovery since June 2020, with the ongoing vaccination scheme expected to further spur economic recovery.⁵⁰ Sri Lanka's economy was already showing signs of weakness before the COVID-19 pandemic. After growing by 2.3 percent in 2019, the economy contracted by 1.6 percent year-on-year in the first quarter of 2020. The contraction, a first in 19 years, was driven by weak performances of construction, textile, mining and tea industries. The economy was expected to contract by 6.7 percent in 2020, linked to the impacts of the COVID-19 pandemic, with all key drivers of demand affected: exports, private

⁴⁰ <http://www.statistics.gov.lk/GenderStatistics/StaticInformation/Population/LifeExpectancyatBirthbySex1920-1922to2011-2013> accessed 01/02/2021.

⁴¹ Solotaroff, Jennifer L., George Joseph, Anne T. Kuriakose, and Jayati Sethi. 2020. *Getting to Work: Unlocking Women's Potential in Sri Lanka's Labor Force*. Directions in Development. Washington, DC: World Bank.

⁴² FAO. 2018. *Country Gender Assessment of Agriculture and the Rural Sector in Sri Lanka*. Colombo.

⁴³ Sri Lanka: Strengthening the Resilience of Post Conflict Recovery and Development to Climate Change Risks in Sri Lanka." [www.undp.org. https://info.undp.org/docs/pdc/Documents/LKA/SCCF Approved Prodoc.pdf](https://info.undp.org/docs/pdc/Documents/LKA/SCCF Approved Prodoc.pdf).

⁴⁴ Projected for 2016-2020 period; Report Of The Technical Group On Population Projections, Nov 2019, MoHFW.

⁴⁵ MoSPI (2019) 'Men and women in India'.

⁴⁶ MoSPI (2019) 'Men and women in India'. http://www.mospi.nic.in/sites/default/files/publication_reports/Women_and_Men_31_%20Mar_2020.pdf

⁴⁷ MoSPI (2019) 'Periodic Labour Force Survey Annual Report, July 2017 – June 2018'.

⁴⁸ World Bank (2020) *Beaten or broken? Informality and Covid*. South Asia Economic Forecast Fall 2020.

⁴⁹ World Bank (2020) *Beaten or broken? Informality and Covid*. South Asia Economic Forecast Fall 2020.

⁵⁰ Indian Department of Economic Affairs, *Monthly Economic Review*, December 2020.

consumption and investment⁵¹. Private consumption, traditionally the backbone of demand in South Asia and a core indicator of economic welfare, will decline by more than 10 percent, further spiking poverty rates.

The COVID-19 crisis is believed to have caused sharp jobs and earnings losses, as well as market instability and disruption. The lower middle-income \$3.20 poverty headcount in Sri Lanka is projected to increase from 8.9 percent in 2019 to 13 percent in 2020. In India, the same measure is projected to increase from 40.9 percent in 2019/2020 to 46.2 percent in 2020/2021⁵². While childcare and eldercare responsibilities have increased for everyone during the lockdown, women – who are often more vulnerable to climate change - have disproportionately felt the burden of increased care work.⁵³ There is growing evidence of the disproportionate and ongoing impact of the pandemic on women in the Asia Pacific region - more women than men have left their paid jobs to care for the sick in their families, do household cleaning and home-school children, while water and fuel are becoming unaffordable and reduced household budgets limit ability to buy food.⁵⁴

Following on from the COVID-19 effects, Sri Lanka is experiencing a rapidly deteriorating economic crisis exacerbated by policy decisions that have drastically driven a reduction in agricultural production and yield, a sharp decrease in foreign exchange reserves, and a steep rise in inflation and food prices. The pressure on public finance and high sovereign debt, as well as the availability and affordability of food, fuels, fertilisers, and medicines, have disrupted Sri Lanka's daily economic activities. Paddy production has dropped by 40 – 50 percent in the 2021/22 Maha harvest season (Oct – March)⁵⁵ and is likely to be similarly impacted in the 2022 Yala season (April – August) due to an acute shortage of fertilisers, pesticides and fuel. Failure of two consecutive cropping seasons is likely to worsen the country's food security situation. Import of essential commodities, including food, has been impacted by the severe foreign exchange constraints; currency depreciation of nearly 80 percent has made imported goods extremely costly for the local population. Sri Lanka's current multi-dimensional crisis has highlighted additional protection issues on top of pre-existing inequalities – for example, recent surveys have shown an increase in domestic violence, as well as of stress and mental health impacts, particularly among women and girls.⁵⁶

Health, nutrition and food security

South Asia has particularly high levels of stunting and wasting in children, with nearly 56 million stunted and more than 25 million wasted.⁵⁷ In the 2021 Global Hunger Index, Sri Lanka ranks 65th (score of 16, moderate level of hunger) and India ranks 101st (score of 27.5, serious level of hunger) out of the 116 countries with sufficient data.⁵⁸

Sri Lanka has made progress towards Sustainable Development Goal (SDG) 2 – for example, the three-fold increase in per capita income and overall reduction in poverty over the past decade has improved economic access to food.⁵⁹ The country is nearly self-sufficient in rice, the staple food, and animal protein products such as fish and poultry, of which it produces more than 97 percent of its needs.⁶⁰ Nevertheless, Sri Lanka has one of the highest rates of acute moderate malnutrition (wasting) in the world – 15 percent prevalence – which WHO defines at the “critical” threshold level. Both the rates of wasting and stunting remain unchanged from 10 years ago, with stunting at 17 percent and continuing to affect optimal physical and mental development. Micronutrient deficiencies, especially anaemia, also remain a concern as they affect all age groups. Overnutrition is rapidly emerging, with 45 percent of women of reproductive age overweight or obese.⁶¹ Approximately one third of the population in the Northern and Uva Provinces (including in the estate sector) and half in the Eastern Province cannot afford the minimum cost of a nutritious diet. Rising commodity prices, partially attributable to increasing production costs, disproportionately affect women and the poor.⁶²

India has had some remarkable successes with respect to food security in recent years. It is home to the world's three largest food-based safety nets and effective disaster management systems, and has achieved self-sufficiency in grain production. However, one quarter of all the world's undernourished people still live in India. Between 2014 and 2019, food insecurity in India increased by 3.8 percent.⁶³ Poor rural households spend more than 60 percent of their incomes on food⁶⁴ and have limited access to diversified foods such as pulses, vegetables, milk and fruits. In some large states such as Assam, Bihar, Chhattisgarh, Madhya Pradesh, Odisha,

⁵¹ <https://openknowledge.worldbank.org/bitstream/handle/10986/34517/9781464816406.pdf>

⁵² World Bank (2020) Beaten or broken? Informality and Covid. South Asia Economic Forecast Fall 2020.

⁵³ South Asia Gender Innovation Lab, Policy Brief, August 2020.

⁵⁴ UN Women and Asian Development Bank (2022) ‘Two years on: The lingering gendered effects of the COVID-19 pandemic in Asia and the Pacific.’

⁵⁵ Rapid Qualitative Food Assessment by WFP and the Sri Lankan Department of National Planning, 2022.

⁵⁶ Rapid Qualitative Food Assessment by WFP with Sri Lankan Department of National Planning, 2022.

⁵⁷ FAO, UNICEF, WFP and WHO. 2021. *Asia and the Pacific Regional Overview of Food Security and Nutrition 2020: Maternal and child diets at the heart of improving nutrition*. Bangkok, FAO. <https://doi.org/10.4060/cb2895en>

⁵⁸ <https://www.globalhungerindex.org> last accessed 28/07/22..

⁵⁹ Independent Review. 2017. National Strategic Review of Food Security and Nutrition Towards Zero Hunger. Colombo.

⁶⁰ WFP Sri Lanka Country Strategic Plan, 2018-2022.

⁶¹ Sri Lanka DHS 2016.

⁶² WFP Sri Lanka Country Strategic Plan, 2018-2022.

⁶³ FAO, IFAD, UNICEF, WFP and WHO. 2020. *The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets*. Rome, FAO.

⁶⁴ National Sample Survey Office. 2014. *Nutritional Intake in India 2011–12*.

Jharkhand and Uttar Pradesh, more than 30 percent of the population lives below the calorie-based poverty line⁶⁵ and the rates of reduction in malnourishment are very low. 35.5 percent of children under 5 are stunted and 19.3 percent wasted;⁶⁶ according to the World Health Organization (WHO) classification, these rates are at “very high” and “emergency” levels, respectively. Although there are no significant differences between genders in malnutrition rates among children, higher mortality rates among girls and the fact that there are more boy children than girl children are indicative of serious bias against girls at the household level. The National Family and Health Survey (NFHS) 5 showed a reduction in the prevalence of chronic malnutrition; however, the prevalence of wasting remains stagnant at around 19 percent.⁶⁷ The prevalence of micronutrient deficiencies is also high, with anaemia affecting more than half of women aged 15–49 years and of children aged 6–59 months and 22.7 percent of men aged 15–49 years. Anemia is more prevalent among children from scheduled tribes and castes and other poor households.⁶⁸ The double burden of malnutrition is on the rise, with 24 percent of women and 22.9 percent of men being overweight or obese.

Covid-19 is expected to worsen the overall prospects for food security and nutrition, potentially affecting areas and groups of people not traditionally affected by food insecurity. Immunization, nutrition and other vital health services have been severely disrupted by the pandemic, which potentially threatened the lives of up to 459,000 children and mothers in South Asia over the last six months of 2020.⁶⁹

Climate Change Vulnerabilities, Impacts and Risks

Climate trends and projections

Observed trends

Analysis of past data suggests that **Sri Lanka** experienced warming of around 0.8°C over the 20th century (based on the Berkeley Earth dataset), which accords with the temperature rise reported in Sri Lanka’s Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) of 0.16°C of warming per decade between 1961–1990.⁷⁰ Rates of increase vary across locations but have become faster in recent decades. Mean daytime maximum and mean night-time minimum air temperatures also have increased, with the latter contributing more to the average increase in annual temperature.⁷¹ Although total annual rainfall (past 10 years compared to the 30-year average) remains steady⁷², the variability of the monsoon, including seasonal onset and duration, was observed to be increasing. The number of consecutive dry days has increased, while consecutive wet periods have decreased.⁷³ The observed trends for maximum one-day and 5-day heavy rainfall events, as well as total precipitation on extreme rainfall days, are increasing, indicating increasing rainfall intensity.⁷⁴ In **India**, the annual mean temperature for the period 1901-2019 has also shown a significant increasing trend of 0.61°C per hundred years.⁷⁵ Over the past four decades, the mean annual minimum temperature shows a significant warming trend of 0.20°C/10 years. Increasing trends in heatwaves have been observed over most of the stations across India; and the frequency of occurrence of hot days during the pre-monsoon season shows a significant increase over the east and west coasts of India and interior peninsula.⁷⁶ Odisha has recorded below-normal rainfall across all districts since the 1960s. The “normal” 120 days of monsoon rain has shrunk to 60-70 days, and unusual spikes in rainfall, with torrential rainfall of over 200-250 millimetres/day, are more frequent during the monsoon, frequently resulting in floods.⁷⁷ Based on a 2021 study, neither Andhra Pradesh nor Tamil Nadu has shown any significant changes in southwest monsoon rainfall during the 30-year period between 1989 and 2018.⁷⁸ However, there are differences across the districts: for example, in Tamil Nadu, during the whole southwest monsoon season Madurai and Dharmapuri districts show significant decreasing trends in this 30-year period.⁷⁹ Moreover, in the six years prior to 2019, Andhra Pradesh has experienced heat waves almost every year, with the duration of the heat period increasing in every part of the

⁶⁵ Government of India Planning Commission. 2009. *Report of the Expert Group to Review the Methodology for Estimation of Poverty*. http://planningcommission.nic.in/reports/genrep/rep_pov.pdf

⁶⁶ India National Family Health Survey 5, 2019-2020.

⁶⁷ National Family Health Survey (NFHS-5) (rchiips.org)

⁶⁸ Ministry of Health and Family Welfare, Government of India, UNICEF and Population Council. 2019. *Comprehensive National Nutrition Survey (CNNS) National Report*.

⁶⁹ Unicef (2020) ‘Lives upended: how Covid-19 threatens the futures of 600 million South Asian children’. June 2020.

⁷⁰ Climate Risk Country Profile: Sri Lanka (2020); The World Bank Group and the Asian Development Bank.

⁷¹ Climate Change Secretariat (2016) ‘National Adaptation Plan for Climate Change Impacts in Sri Lanka 2016-2025’.

⁷² Punyawardena et al. Spatial Analysis of Climate Change Vulnerability. Natural Resources Management Centre, Dept. of Agriculture, 2012

⁷³ Premalal, 2009; Ratnayake and Herath, 2005).

⁷⁴ Recent Trends in Climate Extreme Indices over Sri Lanka January 2018 American Journal of Climate Change 07(04):586-599. DOI: [10.4236/ajcc.2018.74036](https://doi.org/10.4236/ajcc.2018.74036), Jayawardene et.al

⁷⁵ MoEFCC. (2021). *India: Third Biennial Update Report to the United Nations Framework Convention on Climate Change*. Ministry of Environment, Forest and Climate Change, Government of India.

⁷⁶ MoEFCC. (2021). *India: Third Biennial Update Report to UNFCCC*.

⁷⁷ Odisha Forest and Environment Department (2018) *Odisha State Action Plan on Climate Change 2018-2023*.

⁷⁸ IMD (2021) *Observed Monsoon Rainfall Variability and Changes during Recent 30 years (1989-2018)*.

⁷⁹ IMD (2020) *Observed Rainfall Variability and Changes Over Tamil Nadu State*. https://imd pune.gov.in/hydrology/rainfall%20variability%20page/tamil_final.pdf last accessed 29/07/22.

state.⁸⁰ There is a significant increasing trend in the frequency of heavy rainfall days over the northern parts of Tamil Nadu, northern parts of Andhra Pradesh, and adjoining areas of southwest Odisha.⁸¹

Projected changes

Projections for South Asia are for a rise in temperature of 2°C by 2050, which will exceed 3°C by 2100, accompanied by increased extremes in minimum and maximum temperatures.⁸²

Temperature rise in Sri Lanka is projected to be marginally lower than the global average. Under the highest emissions pathway (RCP8.5) temperatures are projected to rise by 2.9°C–3.5°C by the 2090s, over the 1986–2005 baseline. In contrast, warming of 0.8°C–1.2°C is projected over the same time horizon on the lowest emissions pathway (RCP2.6).⁸³ Sri Lanka faces significant threat from extreme heat, with the number of days surpassing 35°C potentially rising from a baseline of 20 days to more than 100 days by the 2090s (under RCP8.5). In **India**, the annual mean surface air temperature rise by the end of the century ranges from 3.5°C to 4.3°C.⁸⁴ Under all emissions pathways, the rise in annual minimum temperatures is around 18–21% higher than the rise in average temperatures. Warming on higher emissions pathways is strongly biased towards the winter and pre-monsoon months.⁸⁵ The all India averaged frequency of summer heat waves will increase in the 2040–2069 period to about 2.5 events per season, and to about 3.0 events by the 2070–2099 period under the medium (RCP4.5) emission scenario, with the average total duration of summer heat waves projected to increase to about 15 and 18 days per season during the mid- and end-twenty-first century respectively under RCP4.5.⁸⁶ The inland regions of Odisha, together with those of the other eastern coastal states of Andhra/Telangana and Tamil Nadu, are facing increased frequency of severe droughts, due to a combination of sustained heatwaves, higher rates of evapotranspiration and higher rainfall variability during monsoons.

Rainfall is projected to decrease across the drier regions of the northern, western and south-east coastline of India, and in the dry zone of **Sri Lanka**⁸⁷. A higher percentage of annual rainfall is projected in the dry zones of Sri Lanka during the monsoon period while the inter-monsoon periods experience less rainfall with droughts expected to increase.⁸⁸ The number of days of more than 90th and 95th percentile rainfall will be increased in Dry/intermediate /wet zone in Sri Lanka till 2100 under the emission scenario RCP 4.5 (Moderate) and RCP 8.5 (high).⁸⁹ For **India**, the patterns of rainfall during monsoons are projected to spatially shift towards the already flood-prone coastal areas and away from the interior regions, inducing a major drought every 5–6 years,⁹⁰ with smaller dry spells every two years. More frequent and intense El Niño events will lead to more frequent heat waves of a longer duration. Several models indicate an increase in the rainfall intensity in the 21st century over most of the regions.⁹¹

Current and future vulnerabilities, risks and impacts of climate change

The selected regions of both countries share many of the same climate risks and impacts, including increasing average temperatures, more frequent and intense heat waves, increased variability of rainfall from the south-west and north-east monsoons, as well as tropical cyclones originating from the Bay of Bengal. In Odisha, the combination of high poverty levels and high percentage of indigenous communities with high natural resource dependency make the state extremely vulnerable to climate change.⁹² All the districts in Sri Lanka's Dry Zone that have been developing in recent decades have been battered by recurrent cycles of floods and drought in the last decade, with severe impacts on food security, nutrition, and income, particularly for those living in remote border districts.⁹³

Rural farming communities in the target areas are heavily impacted by the changes in rainfall patterns, as their main livelihood is rainfed agriculture, mainly paddy cultivation. Land fragmentation and poor productivity are concerns in the dryland farming areas where land holding size generally ranges from 0.5 to 2.0 ha.⁹⁴ Agriculture

⁸⁰ Government of Andhra Pradesh (2019) Heat wave action plan. https://apsdma.ap.gov.in/latestupdate_pdfs/heatwave/March2019/Heat%20wave%20Action%20plan%202019.pdf last accessed 29/07/22.

⁸¹ IMD (2021) Observed Monsoon Rainfall Variability and Changes during Recent 30 years (1989–2018).

⁸² Climate & Development Knowledge Network (CDKN), 2014. The IPCC's Fifth Assessment Report: What's in it for South Asia?

⁸³ Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

⁸⁴ MoEFCC. (2018). India: Second Biennial Update Report to the UNFCCC.

⁸⁵ <https://climateknowledgeportal.worldbank.org/country/india/climate-data-projections> accessed 04/02/21.

⁸⁶ As projected by the CORDEX multi-Regional Climate Model ensemble mean; as stated in the Climate Risk Country Profile: India (2021): The World Bank Group.

⁸⁷ Number of days more than 90th and 95th percentile rainfall will be increased in Dry/intermediate /wet zone in Sri Lanka till 2100 under the emission scenario RCP 4.5 (Moderate) and RCP 8.5 (high). (Hapuarachchi H.A.S.U., Premalal S., 2020, Identify Extreme Rainfall Events for the Period 1991–2017 in Sri Lanka Using Percentile-Based Analysis and Its Projections for 2100 for the Emission Scenarios RCP 4.5 and 8.5, presented at the International Conference on Multi Hazard Early Warning System, 14–16 December, 2020, Colombo, Sri Lanka, Accepted to publish in Springer Journal)

⁸⁸ According to the joint Crop and Food Security Assessment Mission, drought conditions in 2016 and early 2017 led to widespread crop failures almost 40 percent less than the last year's output and 35 percent lower than the average of the previous five years.

⁸⁹ Hapuarachchi H.A.S.U., Premalal S., 2020, Identify Extreme Rainfall Events for the Period 1991–2017 in Sri Lanka Using Percentile-Based Analysis and Its Projections for 2100 for the Emission Scenarios RCP 4.5 and 8.5, presented at the International Conference on Multi Hazard Early Warning System, 14–16 December, 2020, Colombo, Sri Lanka, Accepted to publish in Springer Journal.

⁹⁰ ENVIS Centre of Odisha State of Environment <http://orienviis.nic.in/index1.aspx?lid=24&mid=1&langid=1&linkid=22>

⁹¹ MoEFCC (2012) Second National Communication to the UNFCCC.

⁹² Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018–2023.

⁹³ GoSL and UNDP (undated) Technical Feasibility Report for GCF proposal 'Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management'.

⁹⁴ Ref. for Sri Lanka is GoSL and UNDP (undated) (see above).

is often complemented with inland fisheries in nearby minor irrigation reservoirs – also known in Sri Lanka as irrigation tanks. These minor irrigation reservoirs are dual purpose: they act as water retention during the rainy season and, with proper water management, can serve as irrigation during the dry season and also a source for inland fisheries. However, their structural integrity may be more often compromised with increased intensity of rainfall during monsoons, damaging their irrigation and retention potential. This would lead to inefficient water usage and a lower paddy harvest. Poor water retention capacity also leads to a decline in inland fisheries during the dry season and production of other crops including millets, pulses and oilseeds.

Environmental degradation impacts the already limited alternative income-generating opportunities in these localities. Desertification, which is land degradation in arid, semi-arid, and dry sub-humid areas, collectively known as drylands, has increased in range and intensity in South Asia over the past several decades.⁹⁵ Caused by intersecting factors, including human activities and climatic variations, this results in reduced agricultural productivity and incomes, as well as the loss of biodiversity.

In the targeted areas in India, agriculture is primarily rain-fed, with the majority of farmers dependent on the monsoon for irrigating their crops. Over-reliance on the monsoon poses uncertainties for food production and rural incomes as droughts, floods and variation in rainfall pattern greatly affect the agricultural sector. In the last five decades, Odisha experienced 41 disasters, of which 19 were droughts.⁹⁶ In Odisha, the frequent occurrences of extreme events are impacting on livelihoods and the state's food security – for example, in drought years, there is a considerable loss in production of pulses and oilseeds both during kharif and rabi.⁹⁷ The unique rainfall pattern of Tamil Nadu state compared to rest of India, and the poor water resources, render the state more vulnerable to drought and reduce per capita water availability. This drought-prone situation is similar to the north and east of Sri Lanka where droughts often also occur during the SW monsoon season. In the targeted areas in Sri Lanka, which have a bi-annual rainfall pattern, farmers cultivate both rain-fed and irrigated lands, using the over 40,000 minor irrigation reservoirs spread around the dry zone, which are owned and operated by the local farming community. In the Dry Zone districts, especially in the north, north centre, north-west and east of Sri Lanka, prolonged dry periods have limited access to safe drinking water. Limited recharging of groundwater during these dry periods, and contamination of drinking water sources due to high run-off and sedimentation associated with high intensity rainfall, further aggravate this. In addition, increased heat stress in both countries will affect the productivity of livestock rearing and reduce the viable range of species and varieties.⁹⁸

Projected changes to the timing and amount of precipitation patterns may increase the potential for short-run crop failures and long-run production declines, posing a serious threat to food security. Although there will be a gain in some crops for some regions in South Asia, the overall impact of climate change on agricultural production is expected to be negative. A recent analysis conducted for India indicates the need for a significant restructuring of agricultural systems that factors in crop range shifts to respond to the negative yield outlook for some staple cereal crops.⁹⁹ The cumulative effect of climatic changes has already resulted in increasing frequency and intensity of droughts in the targeted regions, with negative results for agricultural production. Increased intensity of rainfall is leading to high levels of soil erosion that exacerbate land degradation and reduce productivity. At the same time, increased siltation downstream caused by soil erosion reduces the effectiveness of village irrigation systems. In certain districts in Sri Lanka, farming communities may have access to irrigation schemes but because of water scarcity due to reduced functioning of the systems, can only cultivate one crop per season. Other impacts of climate change on agriculture result from increased frequency of soil moisture stress, reduced availability of ground water, and saline intrusion in the coastal belt. Taken together, these will result in increased land degradation, more pest and disease outbreaks, and reduced agricultural yield (quantity and quality).

While vulnerability to increased droughts through climate change is widespread throughout Sri Lanka, it is concentrated in the Dry and Intermediate Zones.¹⁰⁰ Changes in the northeast monsoon seasonal rainfall compared to the base line climatology clearly indicate decreasing rainfall, especially in the dry zone, under both high as well moderate emission scenarios. Reduction in northeast monsoon rainfall (December-February) may increase vulnerability of the agriculture sector as nearly 70% of the Paddy cultivate is collected during the Maha season (September to March) in the dry zone of Sri Lanka. Droughts are expected to increase, especially in the dry and intermediate zones¹⁰¹. In the most vulnerable Divisional Secretariat Divisions (DSDs), farmers on average, earn 63 percent of their income from agriculture. In the Dry Zone districts, especially in the north, north centre, north-west and east, prolonged dry periods have limited access to safe drinking water. Limited recharging of groundwater during these dry periods, and contamination of drinking water sources due to high run-off and sedimentation associated with high intensity rainfall, further aggravate this. There is often insufficient water for

⁹⁵ IPCC (2019) Chapter 3 on Desertification in the Special Report on Climate Change and Land, final draft.

⁹⁶ State Drought Monitoring Cell, Odisha State Disaster Management Authority (OSDMA) [website source: <https://www.osdma.org/preparedness/state-drought-monitoring-cell/#gsc.tab=0>; website accessed on 10-01-2022

⁹⁷ Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023.

⁹⁸ As for example stated in the Climate Risk Country Profile: India (2021): The World Bank Group.

⁹⁹ Climate Risk Country Profile: India (2021): The World Bank Group.

¹⁰⁰ Anamaduwa (Puttalam District), Ambalantota (Hambantota District), and Polpithigama (Kurunegala District) were found to be the most vulnerable DSDs in the Climate Change Vulnerability Data Book of the Ministry of Environment, Sri Lanka (2011).

¹⁰¹ Observed Climate trends, future climate change projections and possible impacts for Sri Lanka: Center for Climate Change Studies, Department of Meteorology, Sri Lanka

domestic consumption, and water sources are often not available in close proximity to where people live. Reduced recharge of groundwater concentrates minerals in the available water to levels well above those recommended for potable water. Similarly, accumulated pollutants from human activities tend to be concentrated during dry periods. The heavy floods that have followed some of the prolonged dry periods have led to runoff that has resulted in erosion and loss of soil nutrients, compelling farmers to apply increasing amounts of inorganic fertilisers. This increases the concentration of pollutants in the water during the dry season, creating a continuing vicious cycle of drought, floods and ground and surface water contamination.

Over 50 percent of South Asians, or more than 750 million people, have been affected by at least one climate-related disaster in the past two decades. Between 1970 and 2008, some 230,000 people were killed and USD 45 billion in damages caused. Estimates are that losses in the region will total USD 215 billion annually each year by 2030.¹⁰² Both countries are already experiencing increased frequency and intensity of droughts and floods, which is affecting quantity and quality of production and the viability of agricultural livelihoods. For example, in Sri Lanka, the agriculture sector showed a negative growth rate of 4.2 in 2016 as a result of a combination of severe drought and heavy rains with flooding.¹⁰³ During 2010 - 2015, Sri Lanka suffered from a cycle of hydro-meteorological disasters that impacted mainly the Northern province of the Dry Zone, with droughts and flood incidents in quick succession, within a few months of each other, alternated within the same districts, affecting the same vulnerable communities and eroding their capacity to cope.¹⁰⁴ India experiences various types of natural hazards including cyclones, depressions, heavy rainfall, thunderstorms, hailstorms, floods, droughts, earthquakes, landslides, heat and cold waves, and tornadoes etc. About 80 percent are hydro-meteorological in nature.¹⁰⁵ India was among the five countries most frequently hit by climate-related disasters between 2002 and 2013.¹⁰⁶ Many parts of India are vulnerable to floods during the monsoons, which cause significant loss of life and damage to livelihood systems, property, infrastructure and public utilities. Flood risk has increased significantly over India during the recent decades.¹⁰⁷

The combination of changed average conditions and increased extreme weather events is resulting in the growing climate risks in the target regions in both India and Sri Lanka. The particular vulnerability of the Indian State of Odisha to climate change lies in the combination of impacts of increased average temperature, decreased and more erratic rainfall, sea level rise, increased storm intensity, extreme droughts and heat waves, and increased wind and rainfall events.¹⁰⁸ Gradual sea level rise and associated effects in both countries are projected to cause long-term damage to coastal settlements, infrastructure, and livelihoods, and to exacerbate migration. The Dry Zone of Sri Lanka is highly vulnerable to a prolonged dry season, and facing reduced precipitation from the seasonal monsoon rains, which risks adversely impacting food security, as it contributes 70 percent of national paddy cultivation, which is the main food crop in Sri Lanka.¹⁰⁹ Sea-level rise is already impacting the lives and livelihoods of Sri Lankans along the coast through the salinization of soils and groundwater, and studies have documented the abandonment of coastal agriculture and degradation of water sources used for human consumption.¹¹⁰ There is growing evidence that coastal hazards will be exacerbated by an increase in the average intensity, magnitude of storm surge and precipitation rates of tropical cyclones.¹¹¹ High-intensity tropical cyclones, including those forming in the Bay of Bengal, have been moving closer to coasts over the past 40 years, potentially causing more destruction than before.

Climatic changes are highly likely to worsen the current indicators for health, as well as food security and nutrition status in the targeted areas. Significant potential increases in heat-related ill health, diarrhoeal disease, and malnourishment are already being experienced by communities in India and are projected to intensify.¹¹² Health-related effects of climate change in the target areas include direct impacts through increased heat stress, and increased incidence of vector- and water-borne diseases (e.g. malaria, dengue and diarrhoea), more injuries and loss of life through extreme events such as flooding and landslides (in the mountainous areas of Odisha), malnutrition and psychological problems. An epidemic of Chronic Kidney Disease (CKD) is occurring in the dry zone of the north central region of Sri Lanka, which is exceptionally hot.¹¹³ This may be linked to poor water quality, which is dependent on water volumes in the tanks, and deteriorates during dry periods, and due to excessive use of fertilizer and agrochemicals, which are concentrated in water supplies and paddies during dry

¹⁰² <https://www.worldbank.org/en/events/2019/11/19/south-asia-hydromet-forum-ii> accessed 10Dec20.

¹⁰³ Department of Census and Statistics, 2016.

¹⁰⁴ GoSL and UNDP (undated) Technical Feasibility Report for GCF proposal 'Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management'.

¹⁰⁵ https://www.clivar.org/sites/default/files/documents/CLIVAR%20Exchanges%2079%20Monsoon%20Mission%20Final_1231.pdf accessed 02/02/21.

¹⁰⁶ United Nations Sustainable Development Framework (2018–2022)

¹⁰⁷ MoEFCC. (2018). India: Second Biennial Update Report to the United Nations Framework Convention on Climate Change. Ministry of Environment, Forest and Climate Change, Government of India.

¹⁰⁸ Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023; and reference below.

¹⁰⁹ Water Resource Management in Dry Zonal Paddy Cultivation in Mahaweli River Basin, Sri Lanka: An Analysis of Spatial and Temporal Climate Change Impacts and Traditional Knowledge

¹¹⁰ Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

¹¹¹ IPCC (2019) 'Special Report on the Oceans and Cryosphere, Summary for Policymakers'.

¹¹² Climate Risk Country Profile: India (2021): The World Bank Group.

¹¹³ With average temperatures of approximately 30 C, as quoted in Glaser et al (2016) 'Climate Change and the Emergent Epidemic of CKD from Heat Stress in Rural Communities: The Case for Heat Stress Nephropathy'. Clin J Am Soc Nephrol 11: 1472–1483, 2016. doi: 10.2215/CJN.13841215

periods.¹¹⁴ A similar epidemic of CKD in rural farmers (of rice, coconuts, and cashews) in Andhra Pradesh, India has also been observed.¹¹⁵ Recent studies have also shown that recurrent heat exposure with physical exertion and inadequate hydration can lead to CKD that is distinct from that caused by diabetes, hypertension, or GN.¹¹⁶ Health problems, including CKD, prevent farmers from productively engaging in livelihood activities, substantially increase family medical expenses, and weaken the rural economy and farmers' ability to withstand losses from livelihood activities. These problems could be exacerbated through climate-change related reductions in water quality and quantity. The increased incidence of CKD has disproportionate effects on women and girls, as it adds to their already heavy load of unpaid care work.

In general, undernutrition is exacerbated by the effects of climate change at all stages of the food value chain, through the following mechanisms: (i) reduced soil quality and water access; (ii) reduced crop and livestock productivity and biodiversity; (iii) micronutrient issues in staple foods as atmospheric CO₂ rises; (iv) increased issues for safety storage and transport of food feed; (v) reduced market access and incomes; and (vi) reduced access to and availability of nutritious food.¹¹⁷ In India, scheduled tribes, scheduled caste communities, casual agricultural labourers and landless, small and marginal farmers¹¹⁸ are among the most vulnerable populations to malnourishment, especially in women-headed households where sufficient access to a diverse diet is lacking.¹¹⁹

During drought years in the proposed project localities, the workload increases drastically both for the men and women in the targeted areas, but the new nature of workload affects the women most, as they are compelled to go out and perform non-traditional roles, leading to many challenges. When the men migrate in search of work, the temporary single status of women may lead to material and sexual exploitation of them on many occasions.¹²⁰ In times of drought and erratic rainfall, women and girls must walk farther and spend more of their time collecting water and fuel. Girls may have to drop out of school to help their mothers with these tasks, continuing the cycle of poverty and inequity. Climatic changes also affect the health of crops and livestock; and women, who are often responsible for producing the food eaten at home, must work harder for less food.¹²¹

Rising commodity prices, partially attributable to increasing production costs linked to climatic changes, disproportionately affect women and the poor. Higher food prices may lead poor households, particularly those headed by women, to resort to negative coping mechanisms such as limiting food consumption, prioritizing food for children (on average, every tenth household) and shifting to less-nutritious diets, with negative effects on health and nutrition.¹²² Climate-related effects on nutrition include impacts on fisheries. Sri Lanka has a high dependency on fisheries for its national protein intake, and is also one of the most at-risk nations on earth in the fisheries sector: the projected potential decline in fish catch due to climate change is 20 percent by the 2050s.¹²³

Under current global mitigation pledges and targets, climate change impacts will cause approximately 37.4 million people in the region will be displaced by 2030, and an estimated 62.9 million by 2050.¹²⁴ These numbers refer to migration linked to slow-onset impacts, namely sea-level rise, water stress, crop yield reductions, ecosystem productivity loss, and drought. They thus do not include the numbers of people who are likely to be displaced by sudden onset climate disasters such as flooding and cyclones, to which South Asia is particularly vulnerable. Some of the direct causes of internal migration in both countries are related to the impacts of climate change, specifically weather and climate-related disasters, and environmental degradation.¹²⁵ As resources begin to reduce, the increasing competition for obtaining them may also increase the likelihood of community disharmony.

Multi-dimensional vulnerability and barriers to adaptation

Multi-dimensional vulnerability

The socio-economic and climatic vulnerabilities discussed above constitute a context of multi-dimensional vulnerability to climate change, operating at different levels. At the national and sectoral level, Sri Lanka's high temperatures, unique and complex hydrological regime, and exposure to extreme climate events make it highly vulnerable to climate change. Key vulnerabilities lie in the agriculture, fisheries and water resources sectors, as well as significant risks to human health, human settlements and urban development, and in coastal zones.¹²⁶

¹¹⁴ GoSL and UNDP (undated) Technical Feasibility Report for GCF proposal 'Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management'.

¹¹⁵ Glaser et al. (2016) – as above

¹¹⁶ Glaser et al. (2016) – as above.

¹¹⁷ IFPRI & UNCSN (2017) Climate change and variability: what are the risks for nutrition, diets and food systems? IFPRI Discussion Paper.

¹¹⁸ In India, marginal farmers are farmers who cultivate (as owners, tenants or sharecroppers) agricultural land of up to 1 ha (2.5 acres). Small farmers cultivate (as owners, tenants or sharecroppers) agricultural land between 1 and 2 ha (5 acres).

¹¹⁹ WFP India Country Strategic Plan 2019-2023.

¹²⁰ Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

¹²¹ Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

¹²² WFP. 2012. Food Security in the Northern and Eastern Provinces of Sri Lanka – A Comprehensive Food Security Assessment Report, Sri Lanka 2012. Colombo.

¹²³ This estimate is based on the SRES scenario A1B, as documented in Barange et al (2014). Impacts of climate change on marine ecosystem production in societies dependent on fisheries. *Nature Climate Change*, 4(3).

¹²⁴ Singh et al, 2020, 'Costs of climate inaction: displacement and distress migration'. ActionAid report, Dec 2020.

¹²⁵ Understanding Migration Trends from Climate Change Affected Districts in Sri Lanka. IOM, WFP, FAO, October 2018.

¹²⁶ Sri Lanka National Climate Change Adaptation Strategy (2010); Sri Lanka NDC, 2016

The case of India is very similar, albeit at a larger scale. Multidimensional vulnerability as expressed on the Notre Dame Global Adaptation (ND-GAIN) Index is depicted in Figure 2.

Figure 1 ND-GAIN rankings for Sri Lanka and India



Sri Lanka was ranked the 60th most vulnerable country and the 94th least ready country, with an overall ranking of 104 out of 181 in the 2020 (most recent) ND-GAIN Index.¹²⁷ The ranking indicates that while it is on the road to responding effectively to climate change, the adaptation needs and urgency to act exceed current readiness. India was ranked 121 out of 181 countries in the 2020 ND-GAIN Index, and the 51st most vulnerable country and the 79th least ready country, indicating a great need for investment and innovations to improve readiness and a great urgency for action. Both countries received high vulnerability scores for projected change in cereal yields, and for dam capacity, while a further area of concern for Sri Lanka was projected change in annual runoff, and for India was agricultural capacity.

Barriers to adaptation

The selected regions of both countries share similar socio-economic vulnerabilities, as well as barriers that increase the difficulty of adapting to climate risks and impacts. Barriers to adaptation for the women, men, girls and boys in rural communities in the targeted areas include limited knowledge on adequate measures to address short- and long-term impacts of climate change and limited financial capacity to invest in adaptation measures.

Institutional barriers include limited capacity of extension services to provide climate and weather information that is easy to understand and actionable for farmers, in the form of localized agromet advisories, and to overlay these with relevant climate-smart practices /adaptive measures that are well suited for various production systems. The meteorological services in both countries have considerable expertise, but reliable and timely climate services through effective dissemination channels to inform more adaptive rural livelihoods are not yet sufficiently targeted, in terms of geographical, agro-ecological and production livelihoods systems, so that the range of user groups within communities can make well-informed ground-level decisions to protect their livelihoods and build their climate resilience.

Environmental degradation in the project localities acts as a further barrier to effective local-level adaptation. This encompasses rapid shrinkage of natural resources upon which agricultural livelihoods depend, such as, land, surface and ground water, soil health and biodiversity. Rapid deforestation is leading to increased soil erosion, watershed degradation and loss of valuable ecosystem services such as water purification and flood control, as well as reduced effectiveness of village water storage bodies through siltation. In Sri Lanka's dry zone, the erosion hazard is high due to low aggregate stability of the soil, high intensity rainfall that exceeds soil infiltration rates, and the undulating landscape.¹²⁸

Gender inequalities influence resilience and vulnerability to poverty, climate and other shocks and stressors, to the detriment of women. Gender-based barriers to adaptation are prevalent in rural farming communities in the targeted areas, where women often have a triple burden (productive, reproductive and community engagement), and their needs are often not addressed in adaptation planning. They seldom have access to and control over resources and decision-making power, as well as productive assets, such as land, loans and credit. Women have considerably less access than men to education and critical information on weather alerts and cropping patterns, affecting their capacity to respond effectively to climate variability.¹²⁹ In Sri Lanka, women are more vulnerable than men because they earn less, work longer hours, and are more likely to engage in unpaid labour (22 percent of the total female workforce), and have longer life expectancy (77.4 years compared with 71.2 years). Moreover, informal labour, including in the agricultural sectors, provides few or no social security benefits. Thirty-three percent of women work in the agricultural sector compared with 27 percent of men; women are therefore more vulnerable to climate shocks.¹³⁰ In Sri Lanka, as is the case in many countries, women usually perform the bulk of care work at home, including childcare, eldercare and other household activities, and are typically overrepresented in insecure forms of employment. One of the differentiated impacts of climate change on young women in India is that early marriage is an increasingly used coping mechanism in response to climate change-induced diminished agricultural livelihoods and resultant poverty. This prevents young women from furthering

¹²⁷ <https://gain.nd.edu> accessed 07/07/2022. The Notre Dame Global Adaptation (ND-GAIN) Index is an annually updated multi-indicator cross-sectoral index that illustrates the comparative resilience of countries.

¹²⁸ Sri Lanka National Action Plan for Land Degradation 2015-2024

¹²⁹ Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

¹³⁰ WFP Sri Lanka Country Strategic Plan, 2018-2022.

their education, subjects them to early childbearing and can incur damaging health, economic and agency impacts. Early marriage is no longer a developmental challenge in Sri Lanka.¹³¹

Gender and ethnic inequality remain intrinsic challenges that sustain malnutrition and food insecurity, to different degrees. In addition to gender, ethnicity is a further attribute that contributes to unequal access to wealth and opportunity in many countries in the South Asian Region. In India, the scheduled tribes, scheduled caste communities, casual agricultural labourers and landless, small and marginal farmers are among the most vulnerable populations in India, especially in households headed by single women where families lack sufficient access to a diverse diet.¹³² Inequalities in intra-household food distribution disproportionately affect women and girls in India because socio-cultural norms dictate that they eat last and least, irrespective of age or health. Women often lack decision-making power with respect to food purchases, and boys are traditionally breastfed longer and receive more vitamin supplementation than girls.¹³³

Many socio-cultural factors – including, inaccessible locations and high levels of poverty and vulnerability – pose challenges to achieving the goals and are frequently barriers to adaptation as well, as they increase vulnerability and reduce the adaptive capacity of the targeted populations. In both countries, the poorest people are most vulnerable to the impacts of climate and economic shocks, which are often interlinked. The considerable effects of the Covid-19 pandemic are increasing vulnerability and fragility of many households and individuals in the project areas, and are likely to exacerbate existing barriers to adaptation.

Increasing rural-urban migration reduces adaptive capacity and may act as a barrier to adaptation, as the rural areas lose important labour resources and experience a profound demographic shift. The patriarchal system combined with the nature of the rural exodus results in increased risks for women, girls, and members of woman-headed households, which may include from crime, exploitation, food insecurity and poor nutrition status, and the loss of household labour. Not all of these effects of the rural exodus necessarily apply in all of the project target localities. Community consultations confirmed high levels of out migration in the targeted areas, in which men have moved out of agriculture to other non-farm sectors as construction workers or in brick industries, while educated people migrate to other countries. This increases women’s care work and pressure to earn an income. Additionally, migrating outside of villages to high-paying jobs is limited for women and girls due to lower education levels and their disproportionate care burden. In Sri Lanka, the rural exodus is perceived as being seasonal and temporary, with climate change as an underlying but not necessarily direct driver.¹³⁴

Regional barriers to adaptation also impinge on the project areas. While some regional mechanisms exist to share common information, expertise and lessons learned between South Asian countries on climate services, currently these are mainly focused on the institutional governance level for comprehensive early warning and HydroMet/ AgroMet systems. Regional linkages for developing and scaling out last mile access to timely and locally accurate climate information that is differentiated for specific livelihoods within the dryland areas have not been developed.

B. Project Objectives

The project’s main goal is to strengthen the climate change adaptive capacity and food security of vulnerable communities in Sri Lanka’s dry zone and India’s eastern coastal states, utilizing a regional, integrated approach. Leveraging differentiated skills and experience in the two countries, and using participatory and bottom-up approaches, the project will enable vulnerable groups to use last mile climate services to plan and implement targeted adaptation measures best suited for different livelihoods and localities, supplemented by livelihoods diversification and enhanced linkages to existing financial services. A regional feedback loop will provide valuable real-time lessons for scaling up and out, both within and beyond the two countries.

The project will achieve its goal through the following two objectives:

1. Strengthen access to reliable, timely and targeted last-mile climate services, and develop a system to co-produce, disseminate and scale up tailored agromet and hydromet advisories
2. Enhance the adaptive capacity of income-poor farming households facing high climate risks, with a focus on women and vulnerable groups, to develop and implement local adaptation plans informed by climate advisories, resulting in improved practices, and diversified, climate-resilient livelihoods

The project will target smallholder farmers in the inland, dry areas of the project localities, with a focus on the needs and barriers of women and vulnerable groups. Vulnerable groups in both countries include marginalised communities, women- and youth-headed households, and food-insecure households. In Odisha, vulnerable

¹³¹ A UNICEF study of 2001 remarks on this phenomenon, and the fact that Sri Lanka is a country in South Asia that represents a success story in addressing the problem of early child marriage.

¹³² Report: Food and Nutrition Security in India 2019, Ministry of Statistics and Programme Implementation and WFP

¹³³ Barcellos, S.H., Carvalho, L.S. and Lleras-Muney, A. 2014. Child Gender and Parental Investments in India: Are Boys and Girls Treated Differently? *Am. Econ. J. Appl. Econ.*, 6(1): 157–189. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3933178/>

¹³⁴ Rapid assessment report: “Understanding migration trends from climate change affected districts in Sri Lanka” – WFP, IOM, FAO October 2018.

groups include members of the particularly vulnerable tribal groups (PVTGs), who are overwhelmingly dependent on natural resources for their livelihoods such as rain-fed agriculture and gathering of Non-Timber Forest Products (NTFP). These tribes predominantly reside in the highland areas which are prone to frequent droughts. The states of Andhra Pradesh and Tamil Nadu do not have significant populations of tribal groups but do contain pockets of poverty with greater vulnerabilities in some districts. In Sri Lanka, additional vulnerable groups include people with disabilities, elderly farming households with low income, other low income households, youth (particularly women), and households with chronically ill patients (such as chronic kidney disease).

Each country has identified a limited number of the most vulnerable districts upon which implementation will be concentrated, to maximise impact on the ground. The vulnerability criteria used encompassed climate risk (increasing temperatures, prone to frequent and severe droughts along with high evapotranspiration, low annual rainfall as well as high rainfall variability during monsoons, etc.); socio-economic criteria (poverty levels, gender inequalities, low per capita income and multi-dimensional poverty, income inequality, high levels of food insecurity and malnutrition, limited knowledge on appropriate adaptation measures to address short and long terms impacts of climate change and limited financial capacity to invest in such adaptation measures); environmental criteria (high levels of land degradation, water scarcity, biodiversity threats); and institutional criteria (limited access to targeted climate services, financial services, and social welfare schemes; insufficient extension support; low irrigation coverage and access to infrastructure, etc.). Table 2 lists the vulnerable districts identified, while **Annex 7** contains further information on the vulnerability assessment process and the proposed project localities. Final decisions on the specific project localities within the targeted vulnerable districts will be decided during the inception stage, based on the above vulnerability criteria as well as practical and logistical considerations. Once the specific localities have been identified, consensus will be developed during the community-based participatory planning process on the specific vulnerable individuals to be targeted in each locality.

Table 2 Vulnerable districts prioritised for project implementation

Country	SRI LANKA				INDIA ¹³⁵		
State/Province	Uva	Northern	Eastern	North-Western	Andhra Pradesh	Odisha	Tamil Nadu ¹³⁶
Prioritised districts	Monaragala	Mullaitivu Vavuniya Mannar	Trincomalee	Kurunegala	Kadapa	Nuapada	Ramanathapuram Dharmapuri

All districts selected in Sri Lanka lie within the Dry zone, except for Kurunegala, which encompasses both Dry and Intermediate zones; the northern part of the district falls within the Dry zone and will be the focus of project activities. In India, all the identified districts lie within dryland areas.

In Sri Lanka, the smallholder farmers in the dry zone districts identified are highly vulnerable to the impacts of climate change, which they are currently experiencing in three main ways: gradual increase in air temperature, increase rainfall variability, and increase in frequency and severity of extreme weather events such as droughts, floods, and winds, with slight variations across the districts. Approximately 92 percent of families/HH members is engaged in agriculture as their major source of income. Employment levels are low, with some people earning their income as salaried employees while a few receive some amounts from Government welfare assistance schemes. Only 40 percent of smallholder farmers in all districts has adopted adaptation measures. Mannar, Mullaitivu and Vavuniya districts included the largest number of farmers using coping and climate adaptation methods while in Kurunegala, Monaragala and Trincomalee districts a large percentage of farmers does not use such adaptation methods.¹³⁷ Paddy rice was found to be the major crop cultivated across the districts during both seasons followed by vegetables, pulses and grains, with fruit cultivation at a lower level. Paddy is not cultivated as a perennial crop in all districts but other field crops (pulses, grains) such as maize, cowpea, green gram, ground nuts etc. (coconut predominantly in Kurunegala district) are cultivated across all districts during both seasons. Most farmers have livestock, mainly in small numbers, e.g. 1-10 of poultry and cattle. Savings levels are in general low and farmers lack sufficient access to extension services, climate advisories, Government welfare schemes and credit or other financial services. Many women lack access to and ownership of resources like credit, land, and technology, and do not have equitable access to managerial positions.¹³⁸

Smallholder farmers in the three states in India are already experiencing considerable climate impacts, particularly increasing drought and heat, coupled with irregular rainfall. All three targeted states show a significant increasing trend in the frequency of dry days during the period 1989-2018.¹³⁹ The Rayalseema region in Andhra

¹³⁵ The localities will be selected as clusters in these districts at inception stage in consultation with local stakeholders.

¹³⁶ In Tamil Nadu, the focus will be on one district, namely Ramanathapuram, and the district Dharmapuri will be included as a part of scale-up and sustainability gradually in the 4th year of implementation, in consultation with the Executing Entity.

¹³⁷ Multi Tech Solutions (2022) ‘Conducting technical assessments in climate change adaptation to inform the full proposal development’. This study, commissioned by the WFP Sri Lanka Country Office, included a household survey of 300 farmers, from which these statistics and insights are drawn.

¹³⁸ Gender Assessment carried out in Sri Lanka for this proposal development.

¹³⁹ MoEFCC (2021) Third Biennial Update to the UNFCCC

Pradesh includes four districts that are particularly prone to drought conditions. The district of Kadapa in Andhra Pradesh faces high exposure to droughts due to successive failures of the northeast monsoon, combined with uneven rainfall distribution of the southwest monsoon and farmers overexploiting groundwater resources, and is identified, together with Anantapur district, as the strongest heat pocket in the state.¹⁴⁰ Tamil Nadu has a highly specific climate in India, referred to as semiarid and tropical monsoon, due to its topographical features and location, and is thus vulnerable to floods, hailstorms, heat waves, drought, thunder and lightning, and forest fires. Ramananthapuram is ranked as the most vulnerable district in Tamil Nadu, with high levels of vulnerability in its inland dryland regions that will be the targeted by the project.¹⁴¹ Millets form the staple food of nearly one-third of the human population of Tamil Nadu. Odisha is one of India's underdeveloped states; drought occurs once in every five years, mostly during the Kharif season and mainly affecting paddy cultivation, the staple crop. Nuapada district is ranked as the third most vulnerable district in Odisha¹⁴² and also has a high proportion (33.80 percent) of the tribal population in the district. The cascading effects of droughts on agriculture in the state are reflected in deteriorating nutrition status and out-migration from rural areas. The operational holdings of female and male farmers across the three states are predominantly less than two hectares, which restricts their marketable surplus. In Odisha only 4.1 percent of women have land in their names which is far below the national average of 14 percent.

Please see **Annex 7** for further socio-economic and climate impact-related information on the identified districts in the two countries.

Beneficiary numbers

The number of community members who will benefit from enhanced last mile climate services (LMCS) is expected to be approximately 704,455. At least 52 percent of the total number of beneficiaries of the project will be women. An estimated total of 400 national and sub-national level officers from hydromet agencies and other stakeholders will be trained and equipped to co-produce tailored climate services. The number of community members benefiting from the community adaptation plans in the targeted localities is 942,768. It is expected that most of the rural population in the project areas will benefit from the community adaptation plans, even if they do not directly participate in the planning process. Approximately 33,527 households will benefit from increased income as a result of adapting their agricultural practices due to the LMCS, while 7,300 farmers will be trained and equipped to develop and implement diversified farm and non-farm livelihoods. Please see **Annex 8** for an explanation of the calculation of beneficiary numbers.

C. Project Components and Financing

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount USD
1. Enhanced effectiveness of last mile climate services to enable vulnerable communities to manage and adapt to climate variability and change [3,160,235]	1.1 Strengthened capacities to ensure access to last mile climate services for vulnerable communities	<p>1.1.1. National and sub-national level hydromet agencies and other stakeholders trained and equipped to co-produce tailored climate services for vulnerable groups</p> <p>1.1.2 Strategy and feedback loop for the sustainable co-production and dissemination of tailored last mile climate services developed and validated through community engagement</p> <p>1.1.3 Awareness raising sessions and technical training conducted for local government, service providers and local communities to access, understand and use climate information</p> <p>1.1.4 Last mile climate services disseminated through identified, tailored and continuous communication channels, with feedback mechanism to ensure effectiveness</p>	Sri Lanka and India	2,416,373

¹⁴⁰ Andhra Pradesh State Action Plan for Climate Change (2012)

¹⁴¹ Rama Rao, C.A., Raju, B.M.K., Islam, A., Subba Rao, A.V.M., Rao, K.V., Ravindra Chary, G., Nagarjuna Kumar, R., Prabhakar, M., Sammi Reddy, K., Bhaskar, S. and Chaudhari, S.K. (2019). Risk and Vulnerability Assessment of Indian Agriculture to Climate Change, ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, P.124. Hereafter referred to as NICRA-ICAR 2019.

¹⁴² NICRA-ICAR 2019.

	1.2 Strengthened multi-level systems and regional knowledge sharing to develop and scale out tailored last mile climate services	1.2.1 Advocacy sessions and technical assistance provided to institutionalize co-production of last mile climate services in Sri Lanka and India 1.2.2 Regional knowledge sharing platforms leveraged for vertical and horizontal knowledge exchange and scaling out of tailored last mile climate services	Sri Lanka and India	743,871
2. Community-based adaptation and diversified livelihoods enabled [8,548,420]	2.1 Strengthened community-level capacities to develop and sustain adaptation plans	2.1.1 Community adaptation plans developed through participatory approaches to identify short- to long-term adaptation strategies 2.1.2 Linkages facilitated between community members and financial services for long-term sustainability of adaptation plans	Sri Lanka and India	1,578,107
	2.2 Increased benefits to community members through implementing adaptation plans and diversifying livelihoods	2.2.1 Communities and households provided with technical assistance and resources to implement adaptation measures 2.2.2 Farmers trained and equipped to develop and implement diversified farm and non-farm livelihood options	Sri Lanka and India	6,970,304
Project Execution cost				1,014,549
Total Project/Programme Cost				12,723,204
Project Cycle Management Fee charged by the Implementing Entity ¹⁴³				1,272,320
Amount of Financing Requested				13,995,524

The project is aligned with the Adaptation Fund's revised strategic results framework, in particular with **Outcome 3**: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level; and with **Outcome 6**: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas. Specific outputs the project will contribute to are **Output 3.2**: Targeted population groups participating in adaptation and risk reduction awareness activities; and **Output 6**: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability. The project will contribute to the AF's impact-level result of "Increased adaptive capacity of communities to respond to the impacts of climate change".

D. Projected Calendar

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2023
Mid-term Review (if planned)	July 2025
Project/Programme Closing	December 2027
Terminal Evaluation	April 2028

¹⁴³ Includes WFP Indirect Support Cost of 6.5%

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project components

As a result of economic, social, environmental, climatic and other shocks, many vulnerable groups and individuals in the dry zone of Sri Lanka and India's dry eastern states are at risk of increased food and nutrition insecurity. This risk is exacerbated by currently inadequate coping capacities. The inter-linked vulnerabilities and barriers to climate change adaptation require targeted strategies to overcome them. The project components, outcomes, outputs and activities developed to translate the project objectives into concrete actions will enable community members to make climate-risk-informed decisions and better plan their livelihood strategies over short-, medium- and long-term time frames. Improved access to financial services will help to ensure sustainability beyond the life of the project.

Through participatory and bottom-up approaches, the project will enable the use of targeted last mile climate and weather information packaged with agricultural advisories, to develop and adopt specific adaptation measures best suited for a range of livelihoods in different localities in the dryland areas, as determined by the needs of community members. An integrated development approach will be followed at household, group and community level, that brings together restoration/rehabilitation of minor irrigation reservoirs and associated infrastructure, agroforestry, horticulture, water conservation, integrated farming systems with farm ponds, multi-layered cropping patterns and enhanced post-harvest technologies. Climate-resilient and nutritious varieties of cereals, pulses, vegetables, fruit, fish, poultry and small livestock will be promoted. Livelihoods diversification and enhanced access to financial services will promote sustainability of the proposed interventions. This will result in enhanced climate resilience and food security of vulnerable communities across the dry zone of Sri Lanka and the states in eastern coast of India, and provide valuable lessons for scaling out, both within and beyond the two countries.

Component 1: Enhanced effectiveness of last mile climate services to enable vulnerable communities to manage and adapt to climate variability and change

Climate services are defined as the provision of climate information to assist decision making by individuals and organisations.¹⁴⁴ Targeted climate information products, particularly concerning the seasonal rainfall and temperature conditions, are crucial for all the countries of South Asia. As major influencers of seasonal climate of the region, much effort has been put into better understanding and predicting with greater confidence the South Asian monsoons.¹⁴⁵ In general, however, there is still scope for improvement in terms of increased spatial and temporal resolution of forecasts up to block/village¹⁴⁶ level in short to medium range, up to district level in extended range time scale and up to state/level in monthly and seasonal timescales. While all of these aspects are being addressed now in the ongoing and subsequent phases of the Monsoon Mission,¹⁴⁷ the Indian Meteorological Department (IMD) has confirmed that the element still missing is the provision of customised climate services to address agriculture and livelihood practices that change from area to area. This issue was further confirmed during the community consultations conducted to inform the full proposal. For example, in Tamil Nadu, where the access to advisories is reportedly better than in the other two Indian states included in this proposal, the major identified gap was that the advisories do not cover all the crops reflecting the wide variation in cropping patterns even within a block. Limitations on the utility of advisories include lack of information about the underlying local climate, forecast categories that may not provide information about thresholds needed for particular decisions and that are prone to misinterpretation, ambiguity about forecast accuracy and uncertainty, and lack of decision-relevant information. The district level advisories currently available are not considered appropriate by farmers to adopt to their site-specific conditions. Block level advisories covering groups of villages, presently only offered at selected locations, address some of these issues related to special resolution, but this is still not adequate for climate-risk informed decision making.¹⁴⁸ The situation is similar for the dry zones of Sri Lanka, in terms of the lack of targeted and localised climate services; in addition, both countries currently experience a degree of disconnect between the meteorological forecasts and agricultural advisories provided, indicating the need for enhanced communication and integrated development of agro-meteorological advice (agro-met advisories) on the part of the line departments, at different levels (national, state/district, and local).

Climate services involve the production, translation, transfer and use of climate knowledge and information. In order to respond to end-user needs, they require appropriate engagement between providers and users of

¹⁴⁴ WFP (2020) Climate services for food security: guidance for WFP staff. December 2020.

¹⁴⁵ For example, under the Monsoon Mission (MM) Programme, the Indian Meteorological Department (IMD) has made significant advances in operational weather and climate forecasting, due to improvement and augmentation of dynamical NWP and climate models.

¹⁴⁶ A block (full name community development block) is a district sub-division in India's rural areas, which consists of a group of villages. It is a compact area for which effective plans are prepared and implemented through Gram Panchayats. A Gram Panchayat (translated as a 'Village council') is a basic village-governing institution in Indian villages.

¹⁴⁷ Mohapatra et al. (2020), accessed on 02/02/21 at

https://www.clivar.org/sites/default/files/documents/CLIVAR%20Exchanges%2079%20Monsoon%20Mission%20Final_1231.pdf

¹⁴⁸

climate information, together with effective access mechanisms. Consultations with villagers in the target areas confirmed that while they have access to generic climate information, such as seasonal forecasts, through mass media (TV and radio), this is not adequate to meet the challenges in the existing livelihoods. For example, as noted during the community consultations in India, the advisories currently produced assume a homogenous end user who is sufficiently informed and empowered to execute the guidelines and recommendation contained in the bi-weekly agromet advisories. Thus they are not tailored to the needs of women, or to a range of different livelihoods groups. Smallholder farmers, especially women and vulnerable groups, need access to reliable forecast information along with location-specific agricultural advisories at a shorter lead time than the seasonal forecast – for example, one to two weeks in advance, which would allow them to make risk-averse decisions on managing the homestead, their crops and livestock – such as planting drought- or flood-resistant varieties, making arrangements for fodder, etc.

In response to these identified needs, the project will develop a system for timely, reliable climate and weather information tailored to smallholder farmers' needs, as identified through community consultations and livelihood classification, packaged together with agricultural advisories – in other words, last mile climate services (LMCS). This is a key requirement to strengthen capacities to better plan for and manage climate variability and risk, and to adapt traditional practices so that they respond to changing climatic conditions. By linking into local level agrarian service centres and women farmers' groups, the project will harmonize the climate advisories with existing agricultural extension services promoted by them. Special attention will be paid to the needs of women and vulnerable groups, to ensure equitable access to LMCS. The LMCS to be developed will be gender-sensitive as the project will engage in a bottom-up fashion through meaningful consultations with women smallholder farmers specifically to involve them in the knowledge co-creation process. Through an empowerment process the project will support women and vulnerable groups – i.e. women- and youth-headed households, food-insecure households, members of the PVTGs, people with disabilities, elderly farming households with low income, other low-income households, youth (particularly female), and households with chronically ill patients – to better understand and take informed decisions about the most appropriate and targeted form that the climate services should take. These groups will also take decisions about the nature of the dissemination channels that would be most useful for them.

A gender-sensitive approach to LMCS also means taking into consideration access to technology, including mobile phones and radios, as well as literacy levels and adopting the relevant communications channels and trainings to the different needs and requirements of women and men smallholder farmers, as well as other vulnerable groups. It also means ensuring meaningful consultation with women smallholder farmers throughout the process so that their evolving needs are continuously understood and addressed.

Outcome 1.1 focuses on strengthening the capacities of national and sub-national level hydromet agencies, agriculture departments, intermediaries and other relevant stakeholders to co-produce tailored climate services for vulnerable groups, conducting awareness raising sessions and technical training for local government, service providers and local communities to access, understand and use climate information, and disseminating LMCS through identified and tailored communication channels. Outcome 1.2 is focused on strengthening multi-level systems and regional knowledge sharing to develop and scale out tailored LMCS, to provide a broader basis for developing climate-informed community adaptation solutions within the two countries and in the South Asian region. Outcome 1.2 thus reflects a break from the more *ad hoc*, 'pilot project' approach, to one that develops mechanisms for institutionalising and scaling up the bottom-up approach to co-producing LMCS, to ensure country ownership and long-term sustainability. Lessons learned in this regard will be shared at the regional level to promote learning and outreach across South Asian countries.

The term 'intermediaries' in this case means those who support the 'translation' of climate information into knowledge that is actionable (e.g. advisories). They generally act as filters across different disciplines, fields and sectors to assist in decision making, and include extension workers, non-governmental organisation (NGO) staff, community-based organisations (CBOs) and volunteers already working with local communities.

An important initial step will be to develop and implement the project's internal learning and knowledge management (L&KM) strategy to promote systematic learning and dissemination across all project activities, as discussed in section II.H. This L&KM strategy will set out how feedback loops for iterative horizontal and vertical learning across project activities will be established to promote efficient and effective project operations, as well as how the innovative approaches and activities of the project will be documented and shared externally.

Outcome 1.1 Strengthened capacities to ensure access to last mile climate services for vulnerable communities

Output 1.1.1. National and sub-national level meteorological and agricultural agencies and other stakeholders trained and equipped to co-produce tailored climate services for vulnerable groups

Leveraging the comparative advantages and experiences of the two countries, the project will strengthen capacities of national and district level hydro-meteorological agencies, agricultural departments, and extension services and key stakeholders including universities to co-produce, disseminate and scale up tailored climate

services, resulting in an effective and efficient multi-level system for LMCS, driven from the bottom up. The comparative strengths of the IMD and the Sri Lanka Department of Meteorology (DoM) will be harnessed to mutual benefit, through bi-national interaction and working in partnership, so that the necessary capabilities for the hydro-met services, as well as agricultural and other extension services and NGO or CBO intermediaries, so that all levels of the system for developing tailored LMCS are strengthened and made more coherent. The project will partner with different national and/ or international public and private sector entities for technical expertise and training government personnel to better understand issues related to climate variability, climate projections, and long-term impacts of climate change. In India, this could include the Centre for Climate Change Research (CCCR) at the Indian Institute of Tropical Meteorology (IITM), which was established by the Ministry of Earth Sciences (MoES) in 2009. In Sri Lanka, key research partners will be the Climate Change Secretariat of Ministry of Environment, University of Peradeniya and private sector organisations who are pioneers of related subjects. A detailed assessment of the needs and capabilities of the hydromet services to deliver LMCS has been carried out during preparation of the full proposal and used to fine-tune activities, to ensure the project actions are targeted and efficient.¹⁴⁹

Activity 1.1.1.1 Establish bi-national agromet working group on strengthening capacities for LMCS and develop programme of action and schedule for iterative training

Activity 1.1.1.2 Train national and sub-national level agromet agencies and other stakeholders on producing tailored climate services

Activity 1.1.1.3 Provide technical support and equipment to improve the reliability and spatial resolution of the weather and climate forecasts

Activity 1.1.1.4 Develop/strengthen multi-level institutional mechanisms for knowledge sharing, co-production and service delivery

Activity 1.1.1.5 Develop and implement internal project learning and knowledge management strategy

Output 1.1.2. Strategy and feedback loop for the sustainable co-development and dissemination of tailored last mile climate services validated through community engagement

Working with different government agencies, the project will formulate and validate through strong community engagement a strategy for the bottom-up co-development and dissemination of LMCS. This involves introducing community climate advisory services for last mile access to reliable climate and weather information, while strengthening technical capacities of local and other institutions to provide this information to communities. Part of the strategy involves developing a mechanism to streamline and improve information to be timely, succinct and geared towards specific actions to be taken, by coordinating with relevant agencies such as the Departments of Agrarian Development, Agriculture, Irrigation, Meteorology and Environment, as well as the Disaster Management Centre (DMC) in Sri Lanka and relevant disaster management (DM) authorities at different levels in India, on how best to effectively consolidate data into advisory products - simplified climate information in the format of key messages. Agriculture and technology universities will also be included.

The strategy will be developed to promote gender-sensitive and inclusive last mile climate services that address the barriers identified in the gender assessments that were conducted in each country during the development of the full proposal. As indicated in the gender assessment conducted in Sri Lanka, an ethnic division in information dissemination related to climate change and adaptation comes into play when it is not developed and shared in local languages (Sinhala and Tamil); interestingly, the gender assessment revealed that language (and through that, ethnicity) is a more significant intersectional barrier than gender in terms of accessing and sharing information. This includes printed material distributed by government extension services, private organizations, NGOs and field officers. The LMCS strategy will include the importance of translating the LMCS into local languages, for more effective uptake of the advisories, as well as the necessity to build upon and strengthen the existing traditional systems of dissemination that are trusted in the different localities.

An important aspect of this strategy is a mechanism for continuous feedback from end users, ensuring that information is tailored to the needs of all community members in different localities and groups. This will be linked with a mechanism to monitor and ensure effectiveness of the climate services disseminated. Inter-departmental coordination will be strengthened to facilitate co-production of tailored climate services.

Lessons learned from the current piloting of LMCS in Sri Lanka, and other successful relevant initiatives in India, will be integrated into implementation. Several such pilots and experiments have been conducted in India for benefit of farmers by both government and non-government entities but they have generally focused on providing the climate information messages without taking into consideration the needs of farmers and the feedback from

¹⁴⁹ This could include for example improving the observation network in the project targeted areas through simple measures such as rain gauges; and capacity development on agrometeorology and seasonal prediction, taking into account differentiated needs of the meteorological services.

farmers on whether they are useful at the local level. The AF project will provide the opportunity to further develop and scale up the outputs and outcomes of the Indian examples and the Sri Lanka LMCS pilot project.¹⁵⁰

Decisions on most appropriate dissemination channels will also be informed by experience of the two countries – for example, the Department of Meteorology (DoM) in Sri Lanka has developed a mobile phone application (app) for marine fisheries with the Dialog mobile service provider, which could be replicated to disseminate localised agromet advisories to farmers. Digital technology will be used for transferring information through simple mobile apps where possible,¹⁵¹ ensuring that equitable access is enabled. For example, in some areas, women have far lower rates of smartphone ownership than men. The project will explore whether the LMCS system it will develop could include improving access to information on related Government schemes and subsidies as a built-in component. Advantages of this would be enhanced year-round relevance and more tangible benefits for communities, thus conferring more confidence in the LMCS system; however, this approach may be more complex to set up and run. Overall, whenever feasible and appropriate for the end users, the project will build upon and enhance existing mechanisms and technologies for dissemination.

Activity 1.1.2.1 Consolidate lessons learned from previous projects and initiatives in the region to inform the approach

Activity 1.1.2.2 Develop mechanisms for continuous and systematic feedback from end users to ensure that information is tailored to the needs of community members in different localities and groups

Activity 1.1.2.3 Formulate and validate through strong community engagement a strategy for the bottom-up co-development and dissemination of LMCS, including digital and other channels

Output 1.1.3 Awareness raising sessions and technical training conducted for local government, service providers and local communities to access, understand and use climate information

Consultations carried out to develop the concept note and the full proposal showed that awareness raising of the benefits of agro-met advisories is needed. During community consultations in Matale district, dry zone division of Wilgamuwa, SL, the majority of farmers did not especially regard weather advisories as they do not receive detailed or localised information, but mainly more generic radio and TV broadcast of weather advisories. The project will additionally raise awareness of the effects of increasing heat stress, which has been identified as a gap during the consultations process, notwithstanding the expertise of the meteorological services in predicting heatwaves. Increased awareness of the longer-term climate projections will assist community members to make longer-term adaptation plans under Component 2. This is particularly important for women's resilience and to promote gender equality, as the gender assessment conducted during full proposal development highlighted that the disproportionate lack of education and awareness on climate change increases the vulnerability of women farmers.

In addition to raising awareness of the benefits of agro-met advisories amongst local community members, local level agriculture service centres / agrarian officers, intermediaries, and other relevant stakeholders will be trained to understand the forecasts, how to scale down the information to the agro-ecological context to promote food security and climate resilience, as well as how to identify media channels with strong rural outreach and develop simplified messages in local languages. Capacity strengthening training sessions for agrarian extension officers, officers of other agencies such as disaster management authorities, and community stakeholders will be conducted with technical support from national and/ or international partners to strengthen understanding of climate and weather information for food security and agriculture. Strengthening capacities of the mandated agencies for gender-sensitive dissemination of LMCS would include in India the State Emergency Operation Centres (EOCs), the Central Water Commission (CWC), IMD, the designated Agricultural Universities assigned for climate advisories such as Odisha University of Agriculture and Technology (OUAT), Tamil Nadu Agricultural University (TNAU), etc. In Sri Lanka, these would include Department of Agriculture, including the National Agriculture Information and Communication Centre and Extension and Training Centre, Provincial Departments of Agriculture, Department of Agrarian Development, Department of Irrigation, and Agricultural Universities: University of Peradeniya and University of Jaffna.¹⁵²

In India, this will be done through the Participatory Integrated Climate Services for Agriculture (PICSA)¹⁵³ approach to build on the PICSA pilot that has already been conducted in Odisha. In Sri Lanka, either PICSA or a similar participatory approach for climate services and agricultural extension and will be carried out through a partnership between the National Meteorological Services and Ministries of Agriculture/extension services. Part of the process will entail training agricultural extension workers, agricultural instructors, traditional

¹⁵⁰ This project is implemented by WFP and the departments of Agriculture and of Meteorology and funded by the 2030 Fund.

¹⁵¹ In Sri Lanka, the Department of Agrarian Development has created and maintains the Agriculture Digital Database calls GeoGoviya. Climate advisories will be sent to farmers mobile via the SMS gateway of GeoGoviya, amongst other dissemination channels.

¹⁵² The project will also explore whether the students of the Agriculture Faculties of the Universities of Uva Wellassa, Peradeniya, and Wyamba could also benefit from these activities, depending on available project budget.

¹⁵³ In partnership with University of Reading.

communicators, and women and youth change agents on effective communication of climate information products and services. Efforts will be made to identify and pilot innovative approaches through a range of dissemination channels, which could potentially involve the private sector in digital technologies including solutions based on internet of things (IOT) that helps monitor multiple key climatic parameters and village level, where this is appropriate in terms of network coverage. Multiple channels for dissemination will be ensured so that and does not lead to inequitable access.

Activity 1.1.3.1 Develop awareness raising and training strategy for local government, service providers and the range of community groups to better understand and use climate information and agro-met advisories

Activity 1.1.3.2 Identify and train dissemination champions (agricultural extension workers, local hydromet officers, traditional communicators, and women and youth change agents) on effective communication of climate information products and services

Activity 1.1.3.3 Conduct regular community awareness raising and outreach sessions, especially with women, female and male youth, and vulnerable groups

Activity 1.1.3.4 Carry out regular technical training on co-production of LMCS with local government, service providers and local communities

Activity 1.1.3.5 Develop a ToT module to be integrated into standard academic agricultural training programmes to ensure long term sustainability

Output 1.1.4 Last mile climate services disseminated through identified, tailored and continuous communication channels, with feedback mechanism to ensure effectiveness

Community consultations will be undertaken to understand the issues faced by the range of smallholder farmers and vulnerable groups in the project localities. This will include the impact of the changing climate on their livelihoods and understanding the weather or climate-related information they most need to enable them to reduce, manage and cope with, and adapt to the changing climatic impacts, both in terms of changing averages as well as extreme events. This will include a focus on the neglected area of heat stress. The consultations will build on WFP's experience with climate services in different countries and regions, and in Community Based Participatory Planning (CBPP) and Seasonal Livelihood Programming (SLP) processes, as well as the experience of the GoSL and Gol and local service providers. Based on these findings, the relevant project partners – the departments of Agriculture and of Meteorology, agricultural universities, NGOs and other intermediaries, and WFP - will develop last mile climate advisories using agro-meteorological information, weather forecasts and drought impact analytics, with other national or, if needed, regional and international partners such as the Regional Integrated Multi-Hazard Early Warning System (RIMES).

Community consultations show broad demand for enhanced climate services, but dissemination will require careful planning. In some of the project areas, for example the dry zone division of Wilgamuwa in Sri Lanka, there is limited mobile network penetration and smart phones are virtually unavailable. All farmers said they would like to receive short term weather forecasts and seasonal predictions through the Agriculture and Irrigation Service Centres, through an offline method, but were not keen to pay for such a service. Furthermore, while most community groups received climate information via government extension services, practical climate adaptation tactics such as sharing drought-resistant seeds were shared among small village groups, and in particular women's groups. These women's groups present good windows of opportunity for community dissemination of LMCS. In India, most households have smart phones but their access to all of the project's intended beneficiaries including women is limited. The community consultations revealed that many women do not have access to climate information and advisory services, and as women often do not have access to mobile phones, they could not hear the calls, and due to lack of reading skills they could not read messages. In the case of men, although they are receiving the advisories, they do not find these useful to adopt in the field. Thus in both countries a more diverse range of dissemination channels is required.

Activities under Outputs 1.1.2 and 1.1.3 will determine the most appropriate dissemination channels, with a learning loop so that these can be fine-tuned throughout the course of project implementation. This learning loop will be linked with a feedback mechanism to monitor and ensure effectiveness of the climate services disseminated. Appropriate dissemination channels will be selected, paying special attention to the development of local institutions and extension workers on how to best advise farmers so that they can make risk informed decisions.¹⁵⁴

Activity 1.1.4.1 Develop last mile climate advisories tailored to end user needs

¹⁵⁴ The project will also draw on lessons learned from the LMCS pilot project in Sri Lanka, in which delivery of climate information messages will be carried out by the Department of Agriculture, in partnership with WFP, the Department of Meteorology and other national and international partners, through the network of agrarian officers delivering door-to-door extension services. This project will also trial a range of different ICTs/channels, including existing live agri-radio broadcasts, text messages, and other applications as appropriate.

Activity 1.1.4.2 Disseminate LMCS through trained last-mile climate services communicators, women's groups, and other locally appropriate channels as identified in 1.1.3

Activity 1.1.4.3 Hold evaluation sessions and document the lessons learned

Outcome 1.2 Strengthened multi-level systems and regional knowledge sharing to develop and scale out tailored last mile climate services

Output 1.2.1 Advocacy sessions and technical assistance provided to institutionalize co-production of last mile climate services in Sri Lanka and India

To promote efficiency and effectiveness, and deepen national ownership of the project's outcomes, Output 1.2.1 will be implemented to advocate with the relevant range of government staff and other stakeholders in both countries for the institutionalization of the system of co-production of gender-sensitive LMCS (as defined above) developed by the project. The existing regional forums mentioned above and below will be utilized to further engender willingness and support for this process. The project will promote the sharing of expertise between the two countries to achieve this output and will additionally provide any necessary technical assistance so that the multi-level systems for climate services in each country are able to take on board and maintain the provision of LMCS in the project localities, and to over time extend this to all other areas of each country. This will include providing technical assistance and training to government officials and intermediaries to strengthen institutionalization of LMCS at all levels. Events such as awareness raising campaigns and advocacy workshops will also be held, in consultation with the meteorological departments and other service providers for agromet advisories.

Activity 1.2.1.1 Develop advocacy messages and methods for institutionalizing and scaling out LMCS in the two countries

Activity 1.2.1.2 Provide technical assistance to strengthen institutionalization of LMCS at all levels

Activity 1.2.1.3 Demonstrate impact of LMCS through evidence base generated to promote institutionalization of LMCS

Output 1.2.2 Regional knowledge sharing platforms leveraged for vertical and horizontal knowledge exchange and scaling out of tailored last mile climate services

The project will leverage and help to further develop regional knowledge sharing platforms for vertical and horizontal knowledge exchange and learning on enhancing gender-sensitive tailored last mile climate services, and tools and systems for potential scale up in other countries. Lessons will be shared from the community level upwards through existing forums, enabling and sharing more broadly a learning-by-doing approach. In other words, regional stakeholders will benefit from emerging lessons from the project on developing and using LMCS for community-based adaptation throughout the lifespan of the project, rather than having to wait for final evaluations and lessons learned exercises at project closure.

Some regional mechanisms do exist to share common information, expertise and lessons learned between South Asian countries as part of south-south cooperation. These in general focus on long-term governance and strengthening institutional support for comprehensive early warning and HydroMet/ AgroMet systems at an institutional level. See Part II.G for a list of existing regional mechanisms, with which synergies will be developed. Building on these existing mechanisms, this regional project will encourage cross-border sharing of institutional knowledge and best practices in co-producing and delivering last mile climate advisory services, as well as lessons from the application of adaptation strategies to promote lasting resilience among communities facing climate variability and climate change, as implemented under Component 2. Existing regional forums will be used to facilitate the ongoing sharing of lessons from the different levels of the bottom-up system for LMCS, as well as community level exchange of best practices, including through the use of relevant technology.

The project will enhance bi-national and regional cooperation by strengthening sharing of information and expertise through existing regional cooperation mechanisms to prevent duplication of efforts, such as South Asian Seasonal Climate Outlook Forum (SASCOF) and Climate Services User Forum (CSUF), South Asia Hydromet Forum (SAHF), South Asian Association of Regional Cooperation (SAARC), and through other regional knowledge sharing platforms currently being developed / supported by the Asia Regional Resilience to a Changing Climate (ARRCC) project and the Climate Adaptation and Resilience for South Asia (CARE) project, and regional agencies such as World Meteorological Organization (WMO) Regional Climate Centre (RCC) at Pune¹⁵⁵ and the Regional Integrated Multi-Hazard Early Warning System (RIMES), and Asian Disaster Preparedness Center). This approach of leveraging and supporting existing mechanisms will facilitate rapid

¹⁵⁵ WMO Regional Climate Centres (RCCs) are centres of excellence that strengthen the capacity of WMO Members in each region to deliver the best climate services to national users. See <https://public.wmo.int/en/our-mandate/climate/regional-climate-centres>.

expansion and scale-up of successes and learnings in a cost effective way, while also reinforcing existing mechanisms. The RCC Pune in India, with support from RIMES, works to strengthen national capacities on climate services through SASCOF and CSUF. SASCOF has a focus only for the forecasters to prepare the forecast, while CSUF is the forum for linking up with the sectors – such as agriculture, in order to develop agro-met advisories. SASCOF and CSUF are always organized together, and, as this occurs on a regular basis, this represents a good window of opportunity for the AF project to both share lessons learned on co-development of LMCS, as well as provide additional support to strengthen the existing forums. The SASCOF/CSUF event supports one NHMS person and one user sector from each South Asian country to attend this forum. The AF project will support additional participants from India and Sri Lanka to attend this forum, including community members who have been involved in co-production and dissemination of LMCS in the project localities, so that valuable lessons learned from the project's innovative activities on LMCS can be shared more broadly in the region.

Similarly, the project will: (i) support participants from user sectors to participate in SAHF Annual conferences; (ii) support community members and national technical staff involved in the project's LMCS activities to participate in the CARE project's webinar series entitled 'Innovation in Climate Adaptation and Resilience', which is convened by RIMES and ADPC¹⁵⁶, and potentially the 'Climate Talks' series of webinars organised by ADPC¹⁵⁷; and (iii) support relevant project participants to contribute to the SAHF webinars, which are facilitated by RIMES. Through leveraging and supporting this range of regional knowledge sharing platforms, the project will share valuable real-time lessons from the project's operations to further the aims of these forums in terms of enhancing national capacities for climate services. This support will include preparing professional documents and presentations to be shared in these forums and webinars, as well as support to physically attend selected events. The project will organise and fund side events at selected forums; these will be identified during project inception so that key lessons can be shared as they are generated, depending on the status of project implementation.

Activity 1.2.2.1 Identify and strengthen where necessary regional knowledge sharing platforms for vertical and horizontal exchange and learning

Activity 1.2.2.2 Share knowledge and lessons learned on an ongoing basis, providing opportunities for bottom-up sharing and exchange of best practices

Component 2: Community-based adaptation and diversified livelihoods enabled

Building on the outputs of Component 1, Component 2 will support communities in the development and implementation of local-level adaptation plans and targeted adaptation options that respond directly to the current and future climate risks and projected impacts, ensuring meaningful participation of women and vulnerable groups throughout the process. The system of climate advisories developed under Component 1 will form an integral part of the adaptation planning carried out under Component 2, so that community members are empowered to take informed and risk averse decisions about adaptation options and their livelihoods.

Based on the needs and priorities identified in the local-level adaptation plans, the project will support smallholder farmers, with a focus on women and vulnerable groups, to implement their preferred adaptation solutions in the targeted drylands areas of the two countries, which have similar agro-ecological conditions and climate risks. Consultations have identified land and forest degradation and water availability/scarcity as critical issues that significantly undermine the viability of smallholder livelihoods and the increasing food insecurity in both countries. These issues are likely to become greater challenges under projected climate change, in the absence of concerted action to build resilience and diversify farming livelihoods. A further area of focus is on short- and long-term impacts of and potential solutions for the increasing heat stress that is affecting the project localities in an ever more serious way.

Community members will select their preferred adaptation solutions from the menu of appropriate adaptation options that has been developed during full proposal development, and which has been informed by the Gender Assessment. The menu of adaptation options synthesises priorities to address key climate risks raised during the community and stakeholder consultations, which endorsed the focus on restoring and rehabilitating traditional water provision systems and protecting their upstream catchments through land restoration / soil and water conservation measures, together with the promotion of integrated farming systems and livelihood diversification activities. The gender assessments conducted in each country further endorse the suitability of the menu of adaptation options to address differentiated needs of women and men and provide opportunities for encouraging youth to adopt agriculture-related livelihoods. Directly addressing the gaps and priorities identified during the consultations process, the project will *inter alia* assist community members to restore and rehabilitate traditional water provision systems, such as the minor irrigation reservoirs (known as 'tanks' in Sri Lanka) and canals found in both countries, which have deteriorated in the past decades due to frequent floods, high run-off and siltation, as well as human-induced impacts such as encroachment and cultivation in the watershed, deforestation of local

¹⁵⁶ <https://www.adpc.net/igo/contents/Media/media-news.asp?pid=1782> last accessed 30/06/2022.

¹⁵⁷ <https://www.adpc.net/igo/contents/Media/media-news.asp?pid=1682> last accessed 30/06/2022.

catchments, and unsuitable agricultural practices. This will of necessity involve landscape restoration and erosion control measures in the catchment areas upstream of the minor irrigation reservoirs, to be implemented as community-based interventions.

There are many traditional methods of climate risk management developed over generations in the project localities. These include cultivation techniques, crop varieties, village irrigation reservoirs – also known as cascade tank systems in Sri Lanka, soil management, natural insect and pest control, integrated crop-livestock systems, and livelihood diversification. The menu of adaptation options has been developed to assist farmers to build on and improve these traditional methods so that they become cost effective and affordable adaptation methods suitable for the changing risks and needs of the project's beneficiaries.

All project activities will be carried out under an explicitly stated and publicised gender-sensitive and sustainable agro-ecological production approach that is environmentally friendly, uses integrated pest management (IPM) and is low external input¹⁵⁸, and promotes social inclusion. This will be a farming systems approach that encompasses restoring and maintaining ecosystems, rejuvenating forests, promoting integrated farming systems that include agriculture, livestock, and inland fisheries in small ponds or reservoirs, as well as protecting and enhancing biodiversity. Combining these practices will address many of the constraints and barriers identified in the project localities, thus disrupting the vicious cycle of land degradation leading to reduced production, resulting in decreased income and nutritional outcomes, which leads in turn to increased poverty and decreased climate resilience; these states may in turn lead to further land degradation through over-exploitation of resources, perpetuating a downward cycle. The gender-sensitive and sustainable agro-ecological production approach is aligned with a key finding of the gender assessment, which was the need to promote sustainable farming practices building on existing examples from women's groups. An example provided was of the women farmers from Monaragala producer groups in Sri Lanka who are not only committed to safeguarding heirloom seed varieties, but also demonstrate that the cultivation of indigenous seeds produces a higher yield with minimum agricultural inputs, and as such are active advocates of the economic and environmental benefits of sustainable farming practices.

Awareness raising on the sustainable agro-ecological production approach will be carried out prior to or as part of the adaptation planning process, to enhance understanding of and build support for this approach. This will involve *inter alia* awareness raising on good agricultural practices (GAPs), water management, crop diversification, including fodder crops, and soil fertility management. GAPs are practices that address environmental, economic and social sustainability for on-farm processes, and result in safe and quality food and non-food agricultural products, and include *inter alia* integrated pest management (IPM), composting, mulching and crop residues management, conservation agriculture, and animal welfare.¹⁵⁹ An important element that directly addresses the current priorities of both governments will be to increase farmers' awareness of the link between forests, climate, agriculture and food security. While a number of schemes are already addressing the issue of providing water points for migrating livestock, the project will provide support for water troughs in areas where this is a gap.

Working with community members in the most climate-vulnerable localities, the project will connect families with technical support and adaptation technology packages/equipment that will improve their agricultural production, asset base, climate resilience and food security, under differing livelihoods. The value chain development support under Output 2.2.2 will serve to strengthen marketing and agribusiness development through engagement with private sector stakeholders.

Outcome 2.1 Strengthened community-level capacities to develop and sustain adaptation plans

2.1.1 Community adaptation plans developed through participatory approaches to identify short- to long-term adaptation strategies

The project will facilitate community members to plan and implement adaptation and resilience building assets selected from the menu of adaptation options, through an inclusive and gender-sensitive community-based process that includes awareness raising of the longer-term climate change impacts projected for the project localities. Women's groups will be specifically involved in ways that help to remove the barriers to their participation, for example with respect to timing the participatory processes so that these do not interfere with their primary roles, providing free child care for the duration of these processes, and ensuring culturally appropriate methodologies that allow their voices to be heard.

The adaptation measures included in the menu of options have been designed to improve the natural resource base upon which the livelihoods of vulnerable communities depend, target the underlying drivers of malnutrition

¹⁵⁸ David Norman, et al., *Defining and Implementing Sustainable Agriculture* (Kansas Sustainable Agriculture Series, Paper #1; Manhattan KS: Kansas Agricultural Experiment Station, 1997). Available at K-State Research and Extension Web Site for Sustainable Agriculture. Low external input agriculture implies adapting and designing the agriculture system to fit the environment of the region, and optimizing use of biological and chemical/physical resources within the agroecosystem,

¹⁵⁹ FAO (2004) Good agricultural practices – a working concept. Background paper for the FAO internal workshop on GAPS, 27-29 October 2004.

and food security, and increase their capacity to absorb weather shocks such as drought and flooding, as well as adapt to longer-term changes such as increased average temperatures and increasingly erratic rainfall.

Community adaptation assets as well as individual adaptation options for households will be selected through a participatory local climate change action planning process, which will be informed and enabled by the LMCS disseminated, as well as the evidence generated and the awareness and capacity developed under Component 1. Individuals in the targeted communities will be empowered to select the assets from the menu of potential options that has been developed during the second round of community consultations to meet the needs of women, men, youth (female and male), and vulnerable groups within the target communities. The participatory adaptation planning process will be informed by the experience of WFP and its partners in community-based participatory planning (CBPP), as well as that of government and non-government partners.

Efforts will be made to link the adaptation planning process to existing statutory and/or customary local-level planning processes, to avoid creating a parallel system. In India, in response to multiple inputs during the consultations with Government officials, ways will be explored to link the climate adaptation planning into the Gram Panchayat Development Plans (GPDP) at the village level and to mobilise convergent resources for it, together with the proposed community water conservation plans suggested by the Ministry of Jalshakti. In Sri Lanka, the community-based adaptation planning will be linked as much as possible with existing community-based planning systems; to date, community involvement has not been systematically implemented by local authorities – although some councils, with the support of external agencies, have developed participatory budgets.¹⁶⁰ However, the AF project will build on the mainstreaming of climate change into district, divisional and village development plans developed during the completed GEF/SCCF project ‘Strengthening the Resilience of Post Conflict Recovery and Development to Climate Change Risks in Sri Lanka’, and will use the climate-resilient village economic development plans developed under the GEF/SCCF project, as well as other local-level community adaptation plans developed through other projects or programmes in the localities, as an input into community adaptation plans, should there be any overlap of districts.

Any supporting studies that might be needed to ensure sustainable and effective concrete adaptation measures under Output 2.1.2 will be identified through more detailed discussions with relevant agencies and service providers and carried out under Output 2.1.1 – for example, it may be necessary to carry out surveys to develop contour plans and area capacity diagrams for the minor irrigation reservoirs to be rehabilitated. The agriculture departments have significant expertise on this in both countries and will play a leading role in the process. Technical, social and environmental studies for the minor irrigation reservoirs and associated infrastructure to be restored and made climate resilient will be conducted. Climate resilience of the reservoirs will be ensured through integration of best available climate projections into the technical studies. The social studies will include conducting a participatory diagnostic of the localised reasons for lack of maintenance of reservoirs and associated infrastructure, so that these can be addressed through appropriate measures such as capacity development of community groups and provision of ongoing technical assistance by local government technical experts once the project has concluded, to ensure sustainability.

A lessons learned exercise will be carried out on specific aspects of traditional knowledge and practice, and other local innovations, as part of local-level adaptation, and training conducted to disseminate local innovations more widely. This will include individual and community-based ground-level innovations to address human – wildlife conflict (HWC), as well as innovations to reduce the impact of heat stress for people, crops and livestock. The project will consider how to frame this within the lens of the “One Health” approach which looks at the health and wellbeing of animals, humans and the environment together under one ecosystem. Academic collaboration will be sought on the One Health approach, for example with the Wildlife Institute Dehradun as a potential partner.

In collaboration with national and sub-national academic and research partners, the project will train local community members to undertake community level monitoring and maintain record keeping on priority parameters such as the water levels in minor irrigation reservoirs, through a citizen science approach. This activity will help to promote project sustainability; as such, linkages will be facilitated with the relevant local and district government departments so that the monitoring outcomes can inform policy and strategy and can result in any corrective actions needed.

Activity 2.1.1.1 Develop nutrition-sensitive, sustainable and climate-resilient farming systems approach and hold awareness raising sessions on this prior to adaptation planning

Activity 2.1.1.2 Conduct multi-hazard climate-risk informed participatory local climate change adaptation planning with communities, connected to existing government rural village-level planning processes

Activity 2.1.1.3 Carry out required technical, social and environmental studies for the minor irrigation reservoirs and associated infrastructure to be restored and made climate resilient

Activity 2.1.1.4 Train and support community members on community level monitoring and record keeping

¹⁶⁰ The local government system in Sri Lanka, Country Profile 2017-2018. https://www.clgf.org.uk/default/assets/File/Country_profiles/Sri_Lanka.pdf

Activity 2.1.1.5 Carry out lessons learned exercise and develop training on specific aspects of traditional adaptation knowledge and local adaptation innovations

Activity 2.1.1.6 Train communities on good agricultural practices (GAPs), integrated farming system and on specific adaptation options selected, including for responding to increasing drought and heat stress

Output 2.1.2 Linkages facilitated between community members and financial services and existing schemes for long-term sustainability of adaptation plans

Communities will be supported in the implementation of the adaptation plans and in the development of financial strategies to ensure long term sustainability of the plans. To this end, the project will facilitate linkages between community members and existing financial services, so that individuals and community-based organisations such as farmer groups can enhance their access to microcredit and saving products, as well as existing microinsurance schemes. Understanding that women face particular barriers to access financial and banking institutions due to a lack of access to land, the project will raise awareness of with relevant institutions and programmes to remove these barriers, for example by reforming the conditions of providing agricultural extension services and government schemes where land ownership is a prerequisite for eligibility for government support. The project will encourage households and different groups within the communities to build financial reserves through savings groups, including through linking them with relevant government entities.

The project will also facilitate linkages between beneficiaries and existing schemes that either primarily target addressing climate change adaptation needs, or schemes in which climate change adaptation still needs to be mainstreamed. Examples of the former in India are the Pradhan Mantri Fasal Bima Yojana (crop insurance scheme)¹⁶¹, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)¹⁶², Pradhan Mantra Krishi Sinchai Yojana (PMKSY) (watershed programme)¹⁶³, Green Revolution - Krishonnati Yojana - Mission for Integrated Development of Horticulture¹⁶⁴, National Rural Livelihood Mission¹⁶⁵, Forestry (National Afforestation and Eco-Development¹⁶⁶), and the Atal Mission for Rejuvenation and Urban Transformation^{167,168}. The MGNREGS, which is a cross-cutting scheme across departments, has already been successfully leveraged by other projects to support adaptation-related community assets – for example, the Paribartan project mobilized this for effective asset building at individual and community level.¹⁶⁹ The project would build on the social capital and institutions build under the National Rural Livelihood Mission (NRLM) schemes of India. Producer Groups and enterprises promoted under NRLM will be used as potential platform for training of the vulnerable groups on adaptation. In Sri Lanka, the GoSL has credit schemes with subsidized interest rates for farming, for micro/ small/ medium/ enterprises (MSME) to invest in agriculture, livestock and fisheries through state banks. In addition, private banks have agricultural loans for a variety of purposes.

During full proposal development, a mapping was carried out in the vulnerable districts of existing microcredit, savings schemes, crop insurance, etc. in order to provide a basis for mobilising financial investments for climate-proofing of livelihoods and village level infrastructures. Despite the identification of numerous schemes as detailed above and other financial institutions and special projects providing financial services to the poor, smallholder farmers and vulnerable households frequently do not receive the information and guidance on how to mobilize the credit for a viable livelihood or agri-business. Improper use of credit and lack of cash flow management are further issues. While there is a process of convergence at the district level in both countries, through which linkages are made and synergies are enhanced across departments, this process does not always have a tangible impact for vulnerable communities. To enhance this convergence, the project will firstly engage in discussions with the Governments, banks, and micro-finance institutions to create a conducive environment for enhancing the uptake of available financial services and support schemes; and secondly facilitate a recurring multistakeholder process with strong village level / panchayat participation that includes government, communities and private sector service providers. The project will design and conduct on a recurring basis 'Local Resilience Support Fairs' to facilitate linkages between local communities, local financial entities, and existing climate adaptation / social protection / microinsurance schemes (government and non-government). Local community radio and other appropriate dissemination channels will be used to raise awareness of these events, leveraging also the dissemination channels developed under Component 1 for LMCS. In India, given the large scale of the states and the limited number of project districts, the project will implement a small demonstration of

¹⁶¹ <https://pmfby.gov.in/>

¹⁶² <https://nrega.nic.in/netnrega/home.aspx>

¹⁶³ <https://pmksy.gov.in/>

¹⁶⁴ <https://midh.gov.in/>

¹⁶⁵ <https://aajeevika.gov.in/>

¹⁶⁶ <http://www.naeb.nic.in/contact.html>

¹⁶⁷ <http://amrut.gov.in/content/>

¹⁶⁸ In addition to these schemes, the Pradhan Mantri Jan Dhan Yojna¹⁶⁸ acts as the policy instrument of direct benefit transfers for various socio-economic transfers to the marginalized population of India.

¹⁶⁹ Concern Worldwide (2015) Paribartan Final Evaluation Report.

the approach with a group of 20 farmers in each of the project districts to document the operational guidelines for scale-up across the district (in the project period) and later across the state (scale-up plan).

The project will provide basic financial literacy training, ensuring equal participation of women farmers in order to assist farmers or agri-MSMEs on issues they face such as keeping income and expenditure records to show the bank, etc.; and by connecting beneficiaries with business service providers/coaches to assist them to develop business plans. It could also provide support to credit providers for innovation to expand outreach. The training will be tailored to the different financial literacy of women smallholder farmers, considering the digital and financial gender gap outlined in the gender assessments. Differential experience could be shared between the countries – for example, India’s experience and expertise on developing extension and support services at many banks (especially the government development banks), which was one of the success factors for dairy development in India.

The activities under this output will contribute to the recovery in the farming sector in Sri Lanka using climate resilient approaches. In the current economic context, facilitating linkages to microfinance while also supporting climate-resilient production, post-harvest technologies and value chain development need to be implemented at an accelerated pace.

Activity 2.1.2.1 Design, publicise, and conduct regular Local Resilience Support Fairs to facilitate linkages between local communities, local financial entities, and existing climate adaptation / social protection / microinsurance schemes

Activity 2.1.2.2 Provide tailored basic financial literacy training to assist farmers and producer organisations, ensuring equal participation of women and men smallholder farmers

Outcome 2.2 Increased benefits to community members through implementing adaptation plans and diversifying livelihoods

Output 2.2.1 Communities and households provided with technical assistance and resources to implement adaptation measures

Under Output 2.2.1, adaptation options selected by community members will be implemented at community and household level. The menu of adaptation options includes climate resilient agricultural technologies, inland fisheries production, ecosystem-based infrastructure creation and sustainable water management approaches, for improved food security and climate resilience. A central element of the development approach will be community-led water conservation and recharge through community rehabilitation of the traditional systems of village reservoirs and irrigation.¹⁷⁰ There will be a strong focus on training and capacity strengthening for community members and extension staff where needed.

Community-based watershed and/or infrastructural works will centre around rehabilitation of the traditional systems of village reservoirs and irrigation that exist in the targeted areas – hereafter referred to as ‘**minor irrigation reservoirs**’. The minor irrigation reservoirs in the Dry Zone of Sri Lanka, classified in that country as ‘minor’ and known as ‘farmer-managed irrigation systems’,¹⁷¹ have deteriorated in the past decades due to frequent floods, high run-off and siltation, as well as human-induced impacts such as encroachment and cultivation in the watershed, deforestation of local catchments and unsuitable agricultural practices.¹⁷² The situation is similar in the Indian states of Odisha and Tamil Nadu. These combined effects have decreased water storage and hence the viability of village irrigation schemes to provide continuous water resources to farmer communities. Siltation due to intense rainfall events and evaporation losses due to high temperatures are more evident in small reservoir systems than in larger reservoirs.¹⁷³ In the traditional systems, conservation of the catchment was considered crucial for the sustainability of the village irrigation system, to improve water yield and storage throughout the year. These catchments are local forests and/or multi-use landscapes yielding fruit, fodder, firewood and other benefits to the community, but devoid of annual crops (vegetables etc).

The project will adopt a catchment /landscape approach to provide support for the rehabilitation of the minor irrigation reservoirs, which are usually community owned assets, and associated infrastructure. This will include rehabilitation of the catchment area above the targeted reservoirs, and rehabilitation of all reservoirs in the cascade system where appropriate, to avoid an *ad hoc* focus on rehabilitation of stand-alone reservoirs. Technical, social and environmental studies to inform the restoration of the reservoirs will include integration of climate projections into the design of the restoration process, so that these structures will have enhanced climate

¹⁷⁰ In India, the Ministry of Jalshakti has noted that this could be linked with Atal Bhujal Yojna.

¹⁷¹ These systems consist of a small reservoir, with an associated irrigation command area of up to 80 hectares / 200 acres.

¹⁷² In Sri Lanka’s dry zone, water stored in the minor irrigation reservoir is used for irrigation of paddy/rice cultivated in the downstream (low land) area in both major and minor rainy seasons. In the minor season, the cultivation extent is decided according to the water availability in the reservoir (generally less than 20 percent of land under minor irrigation reservoir can be cultivated during minor season). The other field crops, fruits and vegetables are primarily cultivated as rain-fed cultivation in the dry zone highlands (middle part of the catena/ home states) during the major monsoon season. Ground water is used for irrigation during dry / minor season in the highlands of the dry zone. (Source: WFP SL CO)

¹⁷³ Aheeyar (2012)

resilience. The minor irrigation reservoirs are distinct from farm ponds, which are very small rainwater harvesting structures, generally constructed by an individual farmer in his own land to irrigate his plot. Infrastructure for watershed management can include small earthen dikes constructed on the upstream watershed of the reservoir, silt trapping ponds on clearly defined water inflow paths, a tree girdle on the high flood level line, and planting the reservation on the downstream of the minor irrigation reservoir with suitable trees. Rehabilitation of the reservoirs will further enhance ecosystem services such as ground water recharge and maintenance / improvement of aquatic biodiversity.

Each option on the menu of adaptation options will be assessed against a set of criteria that include adaptation impact, cost-effectiveness, appropriateness to the context, environmental and social risks, and relevance for targeted communities. Specific options could include improvements to water management and harvesting, community-based natural resource management, introduction of agroforestry, green belts and infrastructure, ecosystem restoration, crop diversification and encouraging climate resistant crop and seed varieties including millets, and climate proofing of household and community assets. Alternate cropping could encompass both promoting alternative, more climate-resilient and nutritious crops such as millet, as well as crop rotation. Training on good agricultural practices (GAPs) will be provided, in line with the project's emphasis on ecological agriculture. During implementation, emphasis will be placed on identifying and exploring specific adaptation options for responding to the increasing heat stress experienced in the project localities, at different temporal scales. At the community level, this could range from short-term behaviour change to reduce the risks to farmers from short periods of extreme heat in current agricultural livelihoods (e.g. planting more trees for shade, keeping better hydrated), to increasing income from agricultural livelihoods in the medium-term to address prolonged periods of extreme heat, to longer-term shifts towards non-agricultural livelihood systems. Conservation tillage, which not only improves the productivity of land but also increases the land surface albedo, thus reflecting most of the incoming solar radiation back into the atmosphere,¹⁷⁴ could also be promoted.

It should be noted that not every item in the menu of adaptation options will be selected in every locality in which the project is implemented. Community members will select their preferred adaptation options during the community adaptation planning process, guided by agricultural extension support as well as the LMCS provided.

Table 3 Menu of adaptation options

Assets created and owned at household level	Assets created and owned by a group of farmers	Assets created and owned by communities
<p><u>SLM / land restoration</u></p> <ul style="list-style-type: none"> Contour ridges, swales, drainage channels¹⁷⁵, pits and half-moons to encourage infiltration Windbreaks Live fencing using multi-purpose trees (protection, soil fertility, forage, etc.) <p><u>Sustainable and climate-resilient agriculture</u></p> <ul style="list-style-type: none"> Good agricultural practices (GAPs) including integrated pest management (IPM), conservation tillage, organic farming Integrated farming systems (including farm ponds) Homestead gardens (vegetables, fruit, fodder crops, wood trees) Climate-resilient and nutritious crops e.g. millets, pulses, etc Fruit trees (orchard) and other crop trees such as Moringa <p><u>Options to increase soil fertility</u></p> <ul style="list-style-type: none"> Cover crops to improve soil health Using silt from reservoirs to improve soils Agroforestry, mulching, and compost making Microbial biofertilisers 	<p><u>SLM / land restoration</u></p> <ul style="list-style-type: none"> Contour ridges, swales, drainage channels Live fencing using multi-purpose trees (protection, soil fertility, forage, etc.) Windbreaks <p><u>Sustainable and climate-resilient agriculture</u></p> <ul style="list-style-type: none"> Good agricultural practices (GAPs) including integrated pest management (IPM), conservation tillage, organic farming, Integrated farming systems Multi-purpose water ponds Fruit trees (orchard) and other crop trees such as Moringa Seed and plant propagation of drought resistant varieties <p><u>Options to increase soil fertility</u></p> <ul style="list-style-type: none"> Cover crops to improve soil health Agroforestry, mulching, and compost making <p><u>Post-harvest technologies</u></p> <ul style="list-style-type: none"> Post-harvest storage facilities for cooperatives and small-processing units/machinery Renewable energy (solar mainly) 	<p><u>SLM / watershed restoration</u></p> <ul style="list-style-type: none"> Area closure for rehabilitation Protection of streams, springs and spouts Assets for restoration of degraded watershed upstream of reservoirs: <ul style="list-style-type: none"> Contour ridges/swales Small earthen dikes Silt trapping ponds on water inflow paths Small-scale re-forestation and woodlot development Windbreaks <p><u>Rehabilitation of water infrastructure</u></p> <ul style="list-style-type: none"> Minor irrigation reservoir rehabilitation Rehabilitation of associated infrastructure

¹⁷⁴ Odisha State Disaster Management Authority (2018) Heat Action Plan for Odisha.

¹⁷⁵ Drainage channels to direct stormwater and reduce damage from flash floods

<p><u>Water conservation and irrigation</u></p> <ul style="list-style-type: none"> • Rehabilitation of shallow hand-dug wells • Rainwater harvesting e.g. from rooftops • Micro-irrigation systems (including solar powered) • Farm ponds for ducks and pisciculture <p><u>Options to reduce heat stress</u></p> <ul style="list-style-type: none"> • Multi-purpose trees for shade, fruit and fodder/other uses • Poultry shelters • Small livestock shelters • Water troughs for livestock <p><u>Wildlife / human adaptation options</u></p> <ul style="list-style-type: none"> • Technologies to reduce human-wildlife conflict e.g. bio-fencing, small-scale solar-powered fences, sound devices • Shelter and foraging opportunities for wildlife <p><u>Post-harvest and renewable energy</u></p> <ul style="list-style-type: none"> • Post-harvest storage facilities and technologies • Energy-saving stoves 		
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In Sri Lanka, in line with priorities of the GoSL, the project will adopt a food assistance for assets (FFA) approach to enable the community-level asset creation, as an effective means to address natural resources degradation in the project areas, through soil and water conservation, flood and erosion control, agroforestry and other relevant ecosystem-based adaptation (EbA) approaches. In India, in line with priorities of the GoI the project will enable similar community-level asset creation for the identified priorities from the adaptation menu of options, aligned with ongoing schemes of the GoI such as MGNREGA, Pradhan Mantra Krishi Sinchai Yojana (PMKSY), as well as a scheme of NABARD, a National Implementing Entity of the AF, to encourage micro irrigation uptake by farmers.¹⁷⁶ The project will provide technical knowledge transfer to restore the community-level minor irrigation reservoirs to make them effective and climate resilient. Through the AF project, communities will be facilitated to create community-level adaptation assets leveraging the wages and subsidies provided by the government schemes mentioned and will augment these with the necessary resources in terms of knowledge inputs, materials, and technology packages.

WFP and its partners have considerable expertise in this approach, including in developing sound approaches to operations and maintenance of community assets, and regarding an exit strategy to ensure lasting outcomes, leveraging the global knowledge of its food assistance for assets programmes.

In response to demand from stakeholders and community members, support will be provided for promotion of **an integrated farming system**, which combines different agricultural activities in a unit area of land to maximise returns, while maintaining soil status and fertility, as an important way to enhance climate resilience for small farmers. This element will build on existing experience, such as the integrated farming system model developed and piloted in one district of Odisha, funded by the State, with plans to scale up to three more districts, and a target of 500,000 farm ponds in five years. An integrated farming system utilises the by-products of one component as an input into another for ensuring supplementary and complementary enterprise relationship, and to reduce environment pollution. Components include crop production, farm pond, kitchen garden, pisciculture, poultry, apiculture, vermicompost, duckery, biopesticides, etc. Soil fertility management will include improving soil health through cover crops/organic manures/tank silts. Improving soil organic matter is interlinked with enhancing soil structure, soil moisture and biological health; hence promoting suitable cover crops immediately after the main crops supports building soil fertility.

The project will also support adaptation technologies that build on traditional knowledge and harness local innovations to address widespread human-animal conflict, with a focus on human-elephant conflict. In 2019, 361

¹⁷⁶ The project will also facilitate access on the part of beneficiaries to the micro-irrigation fund corpus of INR 50,000 million that has been created with the National Bank for Agriculture and Rural Development (NABARD), a National Implementing Entity (NIE) of the AF. The objective of the fund is to facilitate the states in encouraging farmers to install micro-irrigation systems, with micro-irrigation funds already released to Andhra Pradesh and Tamil Nadu for INR 6161.4 million and for INR 4787.9 million respectively.

Asian elephants, which are listed as 'Endangered' on the IUCN Red List¹⁷⁷, were lost in Sri Lanka, which is the highest loss since 1948. This is a particular problem in the dry zone, related to loss of forest cover and increasing drought; reduced access of wildlife to water in the dry season leads to increasing damage to farmers' fields. WWF has highlighted the link between climate change and human-elephant conflict in Asia.¹⁷⁸ Habitat loss, human-elephant conflict and poaching have the potential to increase due to the effects of climate stressors on humans and resulting changes in livelihoods, thus impacting further on the diminishing populations of Asian elephants.¹⁷⁹ Moreover, addressing this issue, which combines both climate- and non-climate drivers in an interlinked way, is a high political priority recently stated by the Cabinet of Sri Lanka. Possible solutions include clearing and protecting elephant corridors, conservation and restoration of forest cover, securing water supplies for elephants, and bio-fencing as well as ongoing community-level mechanisms such as inexpensive locally developed electrified fencing to keep elephants and other wildlife out of crops.¹⁸⁰ Similar problems have been reported in Odisha and Tamil Nadu, with the incidence of human-elephant conflict increasing over the last two decades, related to loss of habitat and agricultural encroachment.¹⁸¹ Given the high daily amounts of water elephants need, and the increasing incidence of droughts in the project localities, human-elephant conflict is likely to increase as climate change deepens. The project will explore how to encourage traditional knowledge and local innovations to address these conflicts, as part of local-level adaptation strategies, in collaboration with conservation agencies in the areas. There are also opportunities for associated regional learning and knowledge exchange, as other areas in the South Asian region face similar challenges.

Implementation of Output 2.2.1 will address institutional and socio-cultural barriers such as low technical capacity of extension workers, lower access for farming communities to financial and technical services, particularly for women and the gender-based discriminations." The concrete adaptation activities will be nutrition-sensitive and gender responsive, by working to identify and address the underlying drivers of malnutrition related to livelihoods, knowledge and practices and gender and ethnic inequality. The impact of the climate resilience activities on women and vulnerable groups will be tracked using appropriate indicators, such as differentiated dietary diversity, and MDD-W (minimum acceptable diet for women).

Activity 2.2.1.1 Provide technical support to assist communities to restore and make climate resilient the identified minor irrigation reservoirs and associated infrastructure, using catchment approach

Activity 2.2.1.2 Households implement identified household adaptation options with technical support and/or technical packages

Activity 2.2.1.3 Hold community study tours to share differential experience between the countries

Output 2.2.2 Farmers trained and equipped to develop and implement diversified on-farm and off-farm livelihood options

Given increased temperatures and the changing rainfall conditions, sustainable and longer-term adaptation will require diversification towards high value non-paddy crops, and indeed this is already happening in the project areas, as well as a shift from farm to non-farm occupations. As inland fisheries are considered to have significant scope as an alternate livelihood, associated options for processing and marketing fish produce will be considered. Introducing value chain development for inland fisheries will enhance the income of farmers and help to compensate for loss of agricultural income. The gender-sensitive value chain assessment will include the climate-resilient and nutrient-dense crop varieties identified as suitable for the intervention areas, such as varieties of millet and pulses. The value chain assessment will specifically consider the differentiated needs and priorities of women and men and will prioritise support to those climate-resilient and nutrition-sensitive value chains that will be of particular benefit to women farmer's groups.

In addition to the value chain assessment, the project will conduct an associated market assessment to determine viable alternative livelihoods, informed by longer term adaptation strategies. Based on the findings of the value chain and market assessment, the project will support the development of the identified climate-resilient livelihoods possibilities for farmers' communities, including improved storage facilities, introduction of post-harvest technologies, strengthening of market linkages, provision of equipment to support livelihood diversification, such as processing machines for millet, and skills training for non-farm livelihoods. Regarding farmgate level processing and marketing, this is considered to be particularly important for varieties like millets in Odisha. In Sri Lanka's dry zone, farmgate level processing for grains and legumes such as rice, maize, millets, mung bean, urid, sesame and peanut has high potential for primary processing. Products can be linked to local and export markets and for further processing with local industries. The project will include support for formation of farmer producer organization, self-help groups of women and supporting them in farmgate level processing

¹⁷⁷ Choudhury A et al., 2008. *Elephas maximus*. The IUCN Red List of Threatened Species.

¹⁷⁸ Advani, NK, 2015. WWF Wildlife and Climate Change Series: Asian elephant. World Wildlife Fund, Washington, DC.

¹⁷⁹ <https://www.worldwildlife.org/pages/asian-elephants-and-climate-change>, accessed 7th June 2021.

¹⁸⁰ E.g., a farmer in Moneragala district developed an inexpensive, locally made electric fence using one solar panel and a car battery, at a cost of less than USD75.

¹⁸¹ Palita, Sharat Kumar & Purohit, Kamal. (2008). Human-Elephant Conflict: Case Studies from Orissa and Suggested Measures for Mitigation. 10.13140/RG.2.1.3326.6007.

and markets; as well as supporting youth and women to be change agents for more widespread dissemination and motivation on climate-resilient and diversified livelihoods. Activities to strengthen farmers' organisations and producer's groups will be based on the needs identified for the specific climate-resilient value chains and diversified livelihoods streams that will be focused on under Output 2.2.2. and is likely to include training on business management practices, good governance, collective action, and leadership, with an emphasis on leadership training for women and youth to enhance their equitable participation.

In order to ensure that the project targets at least 52 percent women beneficiaries, the project will provide further support to climate-resilient value chains that target women. Thus, consideration will be given to promoting post-harvest and market support to early-maturing climate-resilient and nutritious crops, as mentioned above, as well as vegetables and small ruminants/poultry. The latter are important supplements both to household nutrition and to income. The value chain and market assessment will incorporate gender and nutrition sensitive analyses to understand the barriers and opportunities faced by different groups, and to develop sustainable solutions for supply chains that offer decent work and benefits to women and men. Women farmers will be trained on the use of solar drying technologies for vegetables and perishable commodities where this is feasible.

The project will explore the adaptation strategy value-add with respect to food processing units at farmgate level, export markets and broadening relevant partnerships; as well as of setting up of marketing channels beyond public procurement, as in the case of millets. The project will strengthen secondary agricultural systems by promoting non-farm skills, such as pickling, papad making, and cottage industries using the increased produce grown under Output 2.2.1; and will improve associated market linkages. Based on the value chain and market assessment, the project will conduct a series of market compliance enhancement programmes such as organic, Fairtrade, and good manufacturing practices. In all instances, the emphasis will be on enhancing and diversifying incomes for farmers by facilitating sustainable access to niche and/or high-value product channels such as organic and Fairtrade, which are also environmentally and socially sound. In response to lessons learned from other projects in the region, including the Sri Lanka project 'Addressing Climate Change Impacts on Marginalized Agricultural Communities Living in the Mahaweli River Basin of Sri Lanka' (known as 'CCAP'), the project will support the formation and strengthening of market-driven linkages among value chain actors.

In addition to participating in the above training and market compliance enhancement activities, women and youth will further benefit through targeted entrepreneurship support; this will be achieved through incubation and mentoring programmes on climate-resilient livelihoods, to serve as incentives for sustainable resilience building targeting women and youth. These activities have been developed to engender a sense of hopefulness and energy into activities to promote climate-resilient and diversified rural economies, based on feedback from women and youth during the consultations process. The project will develop and implement support for the incubation of 'Resilient Risk-informed Rural Entrepreneurs', which will include access to ongoing mentorship. In addition to environmental and social sustainability and climate resilience, the criteria for accessing the incubation and mentorship will include the need to continue to contribute towards building adaptive capacity in the regions from which the selected entrepreneurs come, and to demonstrate how the LMCS developed under Component 1 have been used in the production enhancement and livelihood diversification activities under Component 2. The project will aim to leverage support from the private sector for the incubation and mentorship, so that these can continue on an ongoing basis after project closure. There are good practices within the project localities that are likely to contribute towards the development of risk-informed rural entrepreneurs – for example, the substantial role played by women's groups in Vavuniya and Monaragala in Sri Lanka in sharing information on how to mitigate risks due to climatic conditions, including sharing climate-resistant indigenous seeds.

Any infrastructure developed by the project – for example, small storage or milling facilities – will be designed to be as heat resistant as possible, in addition to other environmental and climate resilience criteria (such as being low carbon and not being at risk from increased flooding).

The project will consider how to assist people who have lost their jobs through Covid – for instance, women with sewing skills who were retrenched from apparel factories. These women could be supported to produce and market small hand-woven items, possibly decorative cloth bags for high-value agricultural products that could be dried, and shopping bags, etc. Other ideas, for example, are to help women to produce strengthened traditional banana leaf 'gift wrap', as well as paper and bags from elephant dung. All of these items would replace plastic, so this environmental benefit could be used in the marketing process.

Activity 2.2.2.1 Conduct gender- and nutrition-sensitive value chain and market assessment to determine viable alternative longer-term livelihoods, informed by community adaptation planning process

Activity 2.2.2.2 Identify and organise/strengthen farmer organisations and producer groups for alternative climate-resilient and diversified livelihoods

Activity 2.2.2.3 Conduct tailored skills-training programme with refresher activities and exposure visits for groups, including a series of market compliance enhancement programmes such as organic, Fairtrade, and good manufacturing practices

Activity 2.2.2.4 Equip groups with value addition and processing inputs to establish alternative climate-resilient and diversified livelihoods, including improving post-harvest facilities for producer groups / SMEs

Activity 2.2.2.5 Foster market linkages along value chain for alternative climate-resilient and diversified livelihoods

Activity 2.2.2.6 Promote women and youth entrepreneurship through incubation and mentoring programmes on climate-resilient livelihoods

B. Promotion of new and innovative adaptation solutions

The project will adopt a number of innovative approaches, technologies and mechanisms that facilitate new solutions to climate change adaptation and promote resilience amongst the smallholder farmers and vulnerable groups in the project areas.

A central and innovative element of the project is to introduce and promote scaling up of a bottom-up and evidence-based approach to adaptation at community level. Beginning at the community level, the project will introduce a community-driven system of co-production of climate and agricultural advisories, ensuring that women can play an equal role, that will enable smallholder farmers to strengthen their preparedness and risk management strategies against climate change, through reliable climate information. The system of gender-responsive, bottom-up, localised LMCS, delivered through digital technologies where appropriate, is different to the usual method of more top-down development of climate advisories by the meteorological services, which tend to be generalised down from, for example, the national seasonal forecast, and thus are not actionable in different localities and for different livelihoods systems. The project will explore innovative, localised dissemination channels for the tailored climate advisories developed that are responsive to the expressed needs and preferences of a range of community members – women, men, girls and boys in all their diversity, as well as identified vulnerable groups. Many climate advisories have tended to address the needs and access/capabilities of male farmers over those of women farmers, which is why the project places a strong emphasis on participatory bottom-up approaches and will ensure meaningful and participatory consultation with women smallholder farmers specifically and enhance their decision-making role within the community through co-creation of climate change adaptation practices. As described under Output 1.1.2 above, specific steps will be taken so that the participatory and bottom-up approach to developing the LMCS is gender sensitive, including specific trainings for women and girls to address their differentiated needs in accessing climate information and forecasts. While the primary innovation of LMCS is at the community level, project actions will build relevant capacities of the meteorological services, agricultural extension services, and a range of intermediaries at the sub-national and national level to co-develop agro-met advisories, resulting in an effective multi-level operation of the LMCS system. Moreover, demonstration of community-driven co-production will naturally create demand for replication in other places and thereby strong participation can be achieved at both top (national) and bottom (sub-national and community) level. This is an innovative way to drive interest among communities and government agencies for gender-responsive LMCS. The focus on developing a system to institutionalise LMCS within the two countries, and share lessons of this through the regional mechanism, is an innovative way to sustain the benefits beyond the lifespan of the project. Many projects pilot activities in one particular place, with no provisions for institutionalization of any systems developed, and thus there is no trace of the benefits post-project.

A second innovative element related to the above is that the project will leverage regional advantages to combine an improved availability of last mile climate and weather data and related advisories. This will build *inter alia* on the comparative advantages of the IMD and the SL DoM and their partners in each country. Furthermore, the project will work with the relevant agricultural research institutes in both India and Sri Lanka, which have a vast domain of knowledge specific to the cropping systems or agroclimatological zones, and which also often have expertise with community engagement. Harnessing the combined and differentiated agricultural research expertise through the project's regional approach would greatly benefit both the countries. In addition, the project incorporates a regional feedback loop that is innovative in the manner in which it enables lessons from the community and local level to be directly fed into a regional forum in a learning-by-doing approach. Through field reviews and case studies, smallholder farmers will be able to provide feedback on the value added and usefulness of the tailored climate and agricultural advisories, which will serve as lessons in real time as they will be disseminated via the regional forum, as well as for further scaling up of similar activities in each country.

Thirdly, the project has the potential to utilise a WFP innovation, the Platform for Real-time Impact and Situation Monitoring (PRISM), customized to the differentiated needs of each country to support the development of localised agro-met advisories in both countries by providing necessary earth observation products on climate and vegetation indicators. The PRISM platform assesses the potential risk and forecasts the impact of climate hazards on the most vulnerable communities, in order to design risk reduction activities and target disaster responses. PRISM enables WFP's partners in government and WFP country offices to access the latest available climate hazard information alongside vulnerability data through an intuitive, map-based dashboard. PRISM combines information from satellites and other remote sensing sources with WFP data on vulnerability to create

actionable climate information for decision makers, allowing them to prioritize assistance to those most in need. This is designed to overcome the problem of lack of access to latest data and information on climate hazards and the people vulnerable to them. Should PRISM be used, this will build on the experience of the GoSL and WFP with the platform and use of earth observation data for climate risk monitoring and assist to spread the innovation to other countries in South Asia, via the learning and feedback links that will be instituted, via the AF project, with various regional forums. Sri Lanka has concrete experience with using PRISM, especially by the Disaster Management Centre (DMC) in the past. Now, PRISM is being tailored for redeployment at the Department of Meteorology, Sri Lanka for drought monitoring applications with high resolution satellite blended products. PRISM has the potential to strengthen the existing Decision Support Systems and agro-met advisory generation process in India, through the near real time earth observation products on climate and vegetation indicators available at a customized PRISM with value added solutions using IOT that helps monitor climatic data. The initial focus is on monitoring and assessing the impact of drought conditions (rainfall anomalies, standard precipitation index and vegetation health index), with plans to integrate forecast products and bring together data sets such as crop status, water level in dams and reservoirs, to assess the potential impacts of the hazard forecasts and to guide formulating advisories.

A fourth area in which the project will promote innovation is by supporting adaptation technologies that build on traditional knowledge and harness local innovations to address widespread human-animal conflict, with a focus on human-elephant conflict. The project will assist with replicating and scaling up ongoing community-level mechanisms that have proven to be effective, such as inexpensive locally developed electrified fencing to keep elephants and other wildlife out of crops. The project will explore how to encourage traditional knowledge and local innovations to address these conflicts, as part of local-level adaptation strategies, in collaboration with conservation agencies in the areas.

C. Economic, social and environmental benefits

The project will deliver economic, social and environmental benefits to the targeted smallholder farmers in the inland, dry areas of the project localities. While smallholder farmers in the project localities are all highly vulnerable to climate change impacts, the project will have a focus on the needs and barriers of women and vulnerable groups. Vulnerable groups in both countries have been identified as including marginalised communities, women- and youth-headed households, and food-insecure households. In Odisha, marginalised communities have been identified as including members of the particularly vulnerable tribal groups (PVTGs), who are overwhelmingly dependent on natural resources for their livelihoods such as rain-fed agriculture and gathering of Non-Timber Forest Products (NTFP). These tribes predominantly reside in the highland areas which are prone to frequent droughts. The states of Andhra Pradesh and Tamil Nadu do not have significant populations of tribal groups but do contain pockets of poverty and marginalized populations with greater vulnerabilities in selected districts. In Sri Lanka, marginalised and vulnerable groups have been identified as comprising people with disabilities, elderly farming households with low income, other low income households, youth (particularly women), and households with chronically ill patients (such as chronic kidney disease).

In both countries, women, youth, and women- and youth-headed households, as well as food-insecure and low-income households, will be preferentially targeted and thus will participate in the majority of the project activities under Components 1 and 2, and receive the associated benefits set out below. The same is true for tribal populations including PVTGs in Odisha, who will constitute the majority of the project participants in the project localities where they reside. During the inception stage, the specific community members to be targeted will be identified. In this process, as well as during the community-based participatory planning process (Output 2.1.1), the project will implement inclusive approaches to further enable active participation by all identified marginalised and vulnerable groups in all project activities and equitable participation in benefits.

Economic benefits

Reduced crop losses and increased income through provision of targeted climate and agricultural advisories: Through the project actions, smallholder farmers will benefit from timely climate information enabling them to plan and manage climate variability and risk. This will result in economic benefits in the form of avoidance of lost investments through crop failure, as well as maximised production under suitable conditions. The IMD has emphasised that efficient climate services, ranging from forecast a few hours hence forth to long-term forecast, with linked adaptation plans, can significantly reduce the input costs for the farmers. A conservative estimate is that farmers who adapt their agricultural practices based on weather advisories will increase their annual income by 50 percent.¹⁸² The following calculations are based on two good years of harvest in the 5-year period of the project – actual figures might be higher as a result of the risk reduction and adaptation activities of the project. For the dry zone of Sri Lanka, based on an estimated 13,000 households, with an average annual household income of USD 272¹⁸³, this translates into an average increase per household of roughly USD 272 over 2 years,

¹⁸² See Section II.D for the rationale for this, based on studies in India.

¹⁸³ This is 2016 data, as more recent figures are not available. Consultations for the full proposal development will result in an updated figure for the project area.

or an increase in income of approximately USD 3,536,000 in the project area. For India, based on an estimated 20,527 households, with an average annual household income of USD 813 in the targeted states, this translates into an average increase per household of roughly USD 813 over 2 years, or an estimated total increase of income of USD 16,688,451 in the project area. Thus, economic benefits in the project areas in terms of increased combined income as a result of the overall project, could amount to USD 20,224,451. At least 52 percent of the smallholder farmers will be women, and thus women in the project localities in the two countries taken together can be expected to have an increased combined income of at least USD 10,516,714 over the duration of the project. The project will incorporate indicators and methods to track reduced input costs and increased income, in order to gather data that could be used to motivate other initiatives to adopt this approach. The project will implement inclusive technologies to benefit marginalized population, especially the tribal and marginalized populations identified, by reaching them with tailored climate advisories to facilitate decision making. This will enable reduced crop losses, improved incomes and greater participation in decision making by all groups at the local level.

Increased income for poor smallholder farmers through restoration and climate proofing of watersheds and village irrigation systems: In both countries, women, youth, and women- and youth-headed households, as well as food-insecure and low-income households, will be preferentially targeted to participate in restoration and climate proofing of watersheds and village irrigation systems, which is expected to result in increased production and thus income for these vulnerable and marginalised groups and individuals. In Odisha, climate proofing of watershed projects has been undertaken to address risks in the agricultural value chain, which includes increasing community capacities and institutions – with the aim of doubling farmers’ income. This is still in the implementation phase, with no known evaluations, and thus the project team has not been able to identify any quantitative evidence to support this. The project logical framework has been designed to facilitate tracking this outcome, and evidence generated will be consolidated and shared more widely to encourage and further develop similar approaches beyond the scope of the project. In India, the highland areas are often exposed to greater risks of droughts and reduced irrigation options. Restoring and climate proofing of traditional village water bodies and minor irrigation structures will benefit the tribal populations including PVTGS through improved water availability and thus increased resilience. This will also be true for the areas identified in Sri Lanka that are exposed to greater risks of droughts and reduced irrigation options, and where there are high levels of people with disabilities, elderly farming households with low income, other low income households, and households with chronically ill patients (such as chronic kidney disease).

Reduced costs of production through integrated farming system: This system, in which a series of crops are integrated with other compatible activities like animal husbandry, farm ponds for fisheries, etc. helps in judicious use of resources while augmenting financial returns from all the activities. As the system has symbiotically-related activities, this reduces the recurring costs of cultivation, such as fertilisers, thereby maximizing profit as compared to a mono-cropped or single-activity-based system. In both countries, women, youth, and women- and youth-headed households, and food-insecure and low-income households, as well as the tribal populations including PVTGs in Odisha, will receive these economic benefits through participating in activities under Outputs 2.1.1 and 2.2.1. Special focus on growing climate resilient traditional crops such as millets and using inter-cropping will greatly enhance incomes of these communities. The project will partner with local research institutes and universities to monitor and further develop the evidence base for this.

Increased access to savings and microfinance: The project will facilitate linkages with existing financial services. Through this, households will be better able to manage smaller and more frequent shocks through building risk reserves, and access microcredit to facilitate their productive activities and livelihoods. This will allow individuals to become more resilient to both smaller and larger shocks, and to conserve and build their incomes and asset base over time. It is estimated that at least 33,527 HHs will have increased access to savings and microfinance. The project logical framework includes indicators that will monitor this so that the economic benefits can be quantified. The majority of the project beneficiaries will benefit from increased access to savings and microfinance, including people with disabilities, elderly farming households with low income, and households with chronically ill patients (such as chronic kidney disease), who might not be able to participate in activities such as watershed rehabilitation and restoration of village irrigation reservoirs due to their more limited physical capabilities. The project will provide opportunities to the tribal women for alternate livelihoods using simple farmgate level processing of farm produce using renewable sources of energy under Output 2.2.2. Through linkages to micro-finance, women farmers and other vulnerable smallholder farmer groups will be supported to undertake productive activities.

Reduced project transaction costs through the regional approach: Since rural communities in target areas in Sri Lanka and India face common vulnerabilities and shared climatic risks, it will be cost-beneficial for both countries to sustainably build common climate resilient and last mile adaptation approaches to implement like technologies and practices among communities. The project’s regional approach to developing and institutionalising LMCS has been designed to be cost effective and leverage off differential capabilities within the two countries, as well as existing regional knowledge sharing and capacity strengthening platforms. These reductions in project transaction costs translate into more project funds that can be used to directly benefit poor smallholder farmers – thus, the project will be able to do more with less.

Social benefits

Enhanced community ownership and positive citizen-state relations: By using a participatory approach that brings together communities, local government and key state entities like the Departments of Meteorology, Departments of Agriculture, Disaster Management Agencies and potentially the private sector and researchers, the project aims to foster positive citizen-state relations (vertical cohesion) and inspire a resurgence of trust and greater propensity towards community-level dialogue. The bottom-up approach of the project and strong participatory ethos will facilitate enhanced community ownership, which is likely to result in greater sustainability for project assets. It will also elevate the voices of community members from vulnerable and frequently marginalised groups in the provision of climate services and in planning and implementation of adaptation. The project will ensure that all marginalised and vulnerable groups identified, such as the tribal populations and PVTGs in Odisha, and disabled people and households with chronically ill patients in Sri Lanka, will participate in the community-based planning processes, so that project activities can be further fine-tuned and USPs selected that will provide them with the maximum benefit. Engaging the marginal populations through the participatory approach to climate services (Outcomes 1.1 and 1.2) and decision making on adaptation options and livelihood diversification (Outcomes 2.1 and 2.2) will empower them through their participation in development of local level adaptation plans in both countries.

Enhanced gender equality and increased agency for women through the project's gender focus: At least 52 percent of the total project beneficiaries will be women. A detailed gender assessment was carried out during project preparation to assess different needs and barriers of men, women, youth and their intersecting identities (age, abilities, location, ethnicity, language, gender, social class). Based on the outcomes of this and of further gender-sensitive consultations, project activities have been designed to accommodate women and people with different abilities while also considering their availability and care responsibilities. During project implementation, community-based participatory planning (CBPP) processes will be employed with active participation of tribal populations in India, and women, youth, disabled and elderly people, allowing their specific needs to be included in the adaptation plans. Particular attention will be given to ensure women's participation in decision making at community level, to enhance their agency and active leadership in climate change adaptation, as well as reduce dependency and vulnerability. Women self-help groups will be leveraged to support livelihood activities through facilitation of access to microfinance. Each of the project management units will include a Gender and Inclusion Officer and additional provisions have been spelled out for gender mainstreaming – please see Part III.A for more details. To reduce the potential for aggravating existing gender inequalities, this project will ensure meaningful consultation of all beneficiaries, as well as utilizing a gender-sensitive approach that takes into account the diverse needs, realities and interests of women and girls, men and boys.

Enhanced cultural resources and social cohesion through restoration of village irrigation systems: minor irrigation reservoirs / village tanks are described as the “pivot” on which the life in the Dry Zone revolves even in the modern times. The multi-purpose services provided by these reservoirs in both India and Sri Lanka range from economic purposes such as irrigating the command area, social purposes such as domestic use (drinking, bathing and washing), meeting livestock needs, supplementary food (roots and fish), environmental purposes such as cooling a harsh climate, groundwater recharge and cultural needs such as use for festivals. Thus, restoring these reservoirs will have significant cultural benefits that can promote social cohesion. These cultural benefits will accrue to all residents in the project localities, and not just to the project beneficiaries who are actively participating in restoration of the village irrigation systems.

Enhanced food security and nutrition: Resilience building activities will unlock improved natural resources management and be accompanied by capacity development and technical packages for sustainable and climate-resilient agricultural practices. The project aims to result in a 20 percent increase in the percentage of HHs in targeted communities with borderline and acceptable Food Consumption Score (FCS). These nutritional benefits will result from the focus on stimulating climate-resilient and nutritious production, as well as from the general increase in income for HHs. More nutritious and climate-resilient production will include different types of fruits and vegetables and also neglected grains/ pulses which are rich in micronutrients such as millets (finger millet, foxtail millet, little millet, pearl millet, sorghum etc.) and cowpea; cultivation of fruits and vegetables which can be marketed for higher values; and production of value-added products that could be marketed as a means of enhanced livelihood, using efficient technologies. This will particularly benefit the tribal and marginalized populations, as they are among the most food insecure and nutritionally vulnerable. The project will aim to deliver equitable benefits for women through gender-sensitive project activities to reduce PHL and increase processing, which will result in more nutritious food available for women and girls as well as all household members, for longer periods, thus reducing the lean season and increasing nutritional indicators such as dietary diversity.

Increased availability and quality of water: Enhanced water harvesting through restoration of minor irrigation reservoirs and deploying climate-smart irrigation techniques such as household drip irrigation, will result in greater water availability and reduced conflict related to its use for household, agricultural and animal use. Increased availability of water for domestic use will assist with climate-related health problems, such as those accruing through the increasing heat stress experienced by smallholder farmers, including the tribal communities in the highlands. Given that women traditionally manage household water, family gardens and livestock and are on the

frontline of managing the impacts of reduced water availability, the project's actions to increase availability and quality of water will have a positive impact on women by reducing their workload and enabling their increased income generation, which will be directly supported by the project. These activities will also particularly benefit low income and women- and youth-headed households, as well as those including people with disabilities and with chronically ill persons, who may have increased water needs and reduced ability to meet these needs.

Environmental benefits

Enhanced biodiversity and hydrological functioning of ecosystem services through restoration of minor irrigation reservoirs and agro-ecological approach of project activities: Sustainable agro-ecological technologies supported by the project, such as agroforestry and IPM, will increase soil fertility and soil structure, as well as prevent biodiversity loss through injudicious application of chemicals. Upland contour structures and protection of stream banks will enhance the flooding protection services provided by the natural environment. Reforestation above reservoirs will be conducted using only locally appropriate indigenous species, and with biodiversity enhancement as a central goal. In addition, once restored, the village reservoirs can act as percolation tanks, recharging aquifers and retarding runoff in areas where water is both precious and scarce. This is significant given that tanks are not isolated entities but are often found in clusters forming a hydrologically integrated system or 'cascade'. It is expected that a total of 50 minor irrigation reservoirs will be rehabilitated, each associated with an average of 17 hectares (42 acres) of catchment (upland) and cultivated areas rehabilitated, resulting in an estimated 850 hectares (2,100 acres) for the project. These restored upland areas can serve as an initial proxy for the enhanced ecosystem functioning the project will deliver. Enhanced biodiversity and hydrological functioning of ecosystem services through restoration of minor irrigation reservoirs and agro-ecological approach of project activities is expected to benefit all residents within the project localities, including the marginalised and vulnerable groups identified, given the fundamental nature of ecosystem functioning for rural livelihoods – not least with respect to mitigation of both droughts and flooding.

Reduced pressure on the natural environment: Activities under Component 2 contribute to transformation from subsistence to sustainable livelihoods for vulnerable people by (i) reducing pressure on landscapes and the natural environment (e.g. avoiding negative coping strategies such as deforestation); (ii) gradually increasing adaptive capacity through training, creation and management of climate adaptation assets; and (iii) improving productivity and building economic protection from shocks, thereby preventing relapse into poverty and renewed pressure on the natural environment. The increase in income and livelihood diversification will serve to reduce the pressure on ecosystem goods and services derived from woodlands and rivers that are used by women and men rural farmers, including marginalised groups, in the project target areas to supplement their livelihoods. The tribal populations and marginalized communities have greater dependency on the environment and natural resources such as NTFPs; thus, reduction in the negative coping strategies they employ through the project's interventions to increase farmer incomes and diversify their livelihoods (Component 2) will benefit these populations and the environment. These ecosystem goods and services themselves are being negatively impacted by climate change, currently largely due to drying effects that result from increased temperature and droughts, more heatwaves, and reduced and/or erratic rainfall.

Reduced GHG emissions by reducing post-harvest food loss: Under Component 2, as one of the elements to support more climate-resilient livelihoods, the project will promote the use of solar energy, which is both sustainable and more cost effective, to reduce post-harvest food loss and increase processing and value addition. In India 300 women farmers will be trained on the use of solar drying technologies for vegetables and perishable commodities, and in Sri Lanka, 150 women farmers will be trained on the same. While this will result in improved incomes, the environmental benefits will be in the form of reducing the post-harvest losses that would have otherwise contributed to GHG emission. Saving 1 Kg of food loss saves 7 Kg of CO₂ equivalent, while processing of 1Kg food saves 0.8 Kg CO₂.¹⁸⁴

In summary, the specific benefits to the identified marginalized and vulnerable groups in both countries, including the tribal communities in India, include (i) Increased access to information, climate services, financial services, government schemes/insurance and resilient agriculture practices, seeds/planting material with requisite know-how; (ii) Increased participation in decision making, preparing household/village adaptation plans, awareness of ecosystem approaches, understanding the availability of adaptation options and having an enhanced ability to select from these; (iii) Greater access to assets, water, forest and agricultural produce, as well as non-farm produce through enhanced incomes; and (iv) Integrated farming systems, alternate livelihoods and improved access to market linkages, all of which will result in increased incomes.

In addition to the above social and environmental benefits, the project has been designed to avoid or mitigate negative impacts and is in accordance with national standards and safeguards. Further detailed consultations with relevant ministries, stakeholders and community members have been carried out during full proposal development to shape activity design to enhance economic, social and environmental benefits and additional consultations will be carried out during implementation under the project's participatory approach; in addition,

¹⁸⁴ Kumar, A. and T.C. Kandpal (2004) 'Solar drying and CO₂ emissions mitigation: potential for selected cash crops in India'. <http://www.eprint.iitd.ac.in/bitstream/handle/12345678/1484/kumarsol2005.pdf?sequence=1> last accessed 29/07/22.

technical support from experts in the field, especially in relation to sensitive or specialized services, including gender and protection issues as well as SLM and environmental management, have been sought and integrated into further design, and will continue to be integrated into project activities during implementation. This will be facilitated through engagement with field experts and technical advisors, including those technical staff contained within the project management units in each country (see Part III.A for more details). When potential sites are identified for watershed management and larger-scale soil and water conservation works, this will be with the involvement of the local authorities, and these sites will need to be approved through the regional and district authorities' approval processes. The Environmental and Social Management Plan (ESMP) in **Annex 2** provides more detail on how negative impacts will be monitored, as well as avoided or mitigated, during implementation.

D. Cost effectiveness

Cost effectiveness will be promoted through the regional approach, in which expertise, resources and innovations at different levels in the two countries will be shared. The significant shared learning-by-doing between the two countries will promote efficiencies and help to avoid duplication between similar projects in the two countries.

A key element of the cost-effectiveness of the regional approach will be to deepen the bilateral partnership on last mile climate services, so that expertise and best practices available within each country can be leveraged and shared on generating reliable climate information, translating this into user-specific advisories, and disseminating this to last mile users. Specific differentiated expertise includes IMD's capacity on generating reliable forecast products, and the Sri Lanka DoM's capacity on monsoon forum and reaching the forecast product to user sector. IMD has a High Performance Computer, WMO's Regional Training Center, and great expertise at generating climate information at various time scales. Sri Lanka's DoM has demonstrated skill at reaching out the climate information to user sectors, and in dialoguing with them to understand the demand-side and in promoting climate-informed decision making. An example of this is the Monsoon Forum, which is organized regularly even during pandemic times. Sharing these and other respective skills and expertise will enable the meteorological agencies and other stakeholders in the countries to not reinvent the wheel, but to rather piggyback on the skills sets and experience of their peers across the water. Tools that will be developed to facilitate the co-production process of agromet advisories in one country could be customized for another country with minimum efforts. Moreover, the learnings from this initiative will be shared on an ongoing basis with other South Asian countries through existing knowledge sharing and capacity strengthening platforms, which will be more cost effective and sustainable than creating new institutions. The regional platforms that will be leveraged include the South Asia Seasonal Climate Outlook Forum (SASCOF) and the Climate Services User Forum, and the South Asia Hydromet Forum (SAHF), South Asian Association of Regional Cooperation (SAARC), and through other regional knowledge sharing platforms currently being developed / supported by the Asia Regional Resilience to a Changing Climate (ARRCC) project and the Climate Adaptation and Resilience for South Asia (CARE) project, as well as regional agencies such as World Meteorological Organization (WMO) Regional Climate Centre (RCC) at Pune, the Regional Integrated Multi-Hazard Early Warning System (RIMES), and the Asian Disaster Preparedness Center (ADPC). This approach of leveraging and supporting existing mechanisms will not only deepen the existing engagement between countries on climate services but will also facilitate rapid expansion and scale-up of successes and learnings in a cost-effective way, while also reinforcing existing mechanisms.

The cost effectiveness and economic rationale for enhanced climate services has been demonstrated through global and regional studies. For example, in India, it is estimated that investment on generating reliable weather forecasts yielded a benefit of 50 times the initial investment in a year, with expected increased benefits in the next few years.¹⁸⁵ Farmers who adapted their agricultural practices based on weather advisories in India increased their annual income by 25 to 53 percent. If the benefits to farmers from the existing top-down approach improves farmers income by 53 percent, then the bottom-up approach planned through this project can be expected to benefit them far more, as the climate services will be more closely tailored to their needs and circumstances.¹⁸⁶

Regarding the concrete adaptation activities and livelihoods diversification that will be enabled under Component 2, there are a number of ways in which the project will promote cost effectiveness. The economic and cost effectiveness rationale for land/catchment restoration has been demonstrated both globally and in the region. Globally, it has been shown that every USD invested into restoring degraded lands yields social returns, including both provisioning and non-provisioning ecosystem services, in the range of 3–6 USD over a 30-year period.¹⁸⁷ A similar range of returns from land restoration activities has been found in India.¹⁸⁸ Thus it can be expected that

¹⁸⁵ National Council of Applied Economic Research (2020) Estimating the economic benefits of Investment in Monsoon Mission and High Performance Computing facilities. Ministry of Earth Sciences, Government of India.

¹⁸⁶ Ibid.

¹⁸⁷ Nkonya, E. et al., 2016a: Global cost of land degradation. In: *Economics of Land Degradation and Improvement – A Global Assessment for Sustainable Development* [Nkonya, E., A. Mirzabaev, and J. von Braun (eds.)]. Springer International Publishing, Cham, Switzerland, pp. 117–165.

¹⁸⁸ Mythili, G., and J. Goedecke, 2016: Economics of Land Degradation in India. In: *Economics of Land Degradation and Improvement – A Global Assessment for Sustainable Development* [Nkonya, E., A. Mirzabaev, and J. von Braun (eds.)]. Springer International Publishing, Cham, Switzerland, pp. 431–469.

catchment restoration carried out above the village water tanks will result in similar efficiencies and returns. A number of studies have provided evidence for the cost effectiveness of early response to drought, combined with safety net transfers and resilience-building activities – for example, a DfID-funded study found the costs of building resilience are offset against the benefits, in benefit-to-cost ratios ranging from 2.3:1 to 13.2:1, depending on the country.¹⁸⁹ Assuming a fairly low benefit to cost ratio of 2.9:1, this would mean for every USD 1 spent on resilience, USD 2.9 of benefit (avoided aid and animal losses, development benefits) are gained.

There is good evidence that rehabilitation of village water schemes, which takes advantage of existing infrastructure in the targeted areas, is more cost effective than construction of new irrigation schemes in the same localities. The Planning Department of the Sri Lanka Department of Irrigation estimated in 2012 that costs (capital) of extending major irrigation were around USD2,200 per acre of cultivable land, while the cost of rehabilitating old village schemes was USD877 per hectare.¹⁹⁰ These figures were not able to be updated during development of the full proposal, due to the ongoing COVID-19 pandemic and economic crisis in Sri Lanka, but will be further interrogated during implementation, and concrete evidence generated that demonstrates the cost effectiveness of this approach.

Table 4 contains additional information about the cost effectiveness of the proposed adaptation solutions as set out in this proposal compared to that of alternative adaptation solutions that were considered, that could have taken place to help adapt and build resilience in the same sector, geographic regions, and communities.

Table 4. Cost effectiveness of the proposed adaptation solution compared to alternatives

Component / Outcome	Selected approach for proposed project	Other possible approach / adaptation interventions
Component 1		
Outcome 1.1 Strengthened capacities to ensure access to last mile climate services for vulnerable communities	<p>A central element of the project is to enhance the ability of smallholder farmers to make their livelihoods more climate resilient through the provision of targeted and actionable last mile climate services. The cost effectiveness and economic rationale for enhanced climate services has been demonstrated through global and regional studies. For example, in India, it is estimated that investment on generating reliable weather forecasts yielded a benefit of 50 times the initial investment in a year, with expected increased benefits in the next few years. Farmers who adapted their agricultural practices based on weather advisories in India increased their annual income by 25 to 53 percent. If the benefits to farmers from the existing top-down approach improves farmers income by 53 percent, then the bottom-up approach planned through this project can be expected to benefit them far more, as the climate services will be more closely tailored to their needs and circumstances.¹⁹¹</p> <p>The proposed solution will strengthen the links between and make use of the existing capacity of various stakeholders involved in the generation and dissemination of agromet advisories including the vulnerable communities. In this process, the Meteorology departments in each country will utilize the domain knowledge of agriculture from the Agriculture departments in agro advisory generation; and the Agriculture departments will utilize weather forecast data from the Meteorology departments. Both</p>	<p>An alternative approach to developing targeted LMCS would have been to support the dissemination of the existing climate information services in each country without trying to make them more targeted and actionable. This would clearly not have been effective or useful for the farmers, as many of them currently do not trust the climate services provided as they do not perceive them to be reliable. Thus this approach would be neither sustainable or cost effective.</p> <p>An alternative approach to strengthening the linkages between different stakeholders for LMCS could have entailed setting up end-to-end capacity within one agency. For</p>

¹⁸⁹ Economics of Early Response and Disaster Resilience Study: lessons from Kenya and Ethiopia (2012); available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/67330/Econ-Ear-Rec-Res-Full-Report_20.pdf

¹⁹⁰ As quoted in the Mahaweli proposal submitted to the AF in 2013.

¹⁹¹ Ibid.

	<p>departments will greatly benefit by engaging with end users on understanding their needs, and decision context, through the feedback mechanism. Dissemination under the proposed solution can be through ICT, lead farmers, intermediaries, all other existing mechanisms. The cost effectiveness of the proposed solution lies in bringing all of these entities, stakeholders and elements.</p>	<p>example, one department would cover all the functions by expanding staff and equipment to collect, generate, and provide necessary information, which would be very expensive. For example, if ICT is only used, heavy investments are needed to procure smart mobile phones and educate the vulnerable communities. This alternate approach is not only expensive but also not sustainable in many ways.</p>
<p>Outcome 1.2 Strengthened multi-level systems and regional knowledge sharing to develop and scale out tailored last mile climate services</p>	<p>A key element of the cost-effectiveness of the regional approach will be to deepen the bilateral partnership on last mile climate services, so that expertise and best practices available within each country can be leveraged and shared on generating reliable climate information, translating this into user-specific advisories, and disseminating this to last mile users. The approach promotes knowledge sharing through the use of and strengthening of existing regional platforms, rather than creating new regional structures.</p>	<p>An alternative approach would have been to reduce costs spent on regional activities and deepening the bilateral and regional partnerships on climate services. However, this would have resulted in each country having to 'reinvent the wheel' in areas in which the other country already had significant expertise – thus ultimately leading to higher costs and reduced effectiveness.</p> <p>A further alternative would have been to create a new regional platform to promote knowledge sharing and scaling out the project's approach to developing LMCS. A new regional platform would require significant additional resources. Moreover, the sustainability of an additional regional platform would be highly questionable as there are several forums/platforms already available for sharing knowledge and experiences on climate services, in which both India and Sri Lanka are active participants.</p>
<p>Component 2</p>		
<p>Outcome 2.1 Strengthened community-level capacities to develop and sustain adaptation plans</p>	<p>The proposed approach is participatory and will build the capacity of communities to implement their own adaptation solutions, supported by the project. The solutions are design participatory for specific contexts, which will bring ownership among the communities and sustainability. Building the capacities of communities in developing climate-risk informed adaptation plans saves losses and damages on multiple counts. These include the costs of sowing and re-sowing due to delayed rains, as well as decisions regarding application of inputs such as water, fertilizers and pesticides. This approach also leads to reduced input costs, and less time needed for harvesting and storage/ transportation leading to reduced losses. Informed adaptation planning at all levels helps better preparedness and systemic /institutional response for sustainable food and nutrition security.</p>	<p>An alternate approach would have been to support the Governments to design and implement adaptation plans without community participation, or without building community capacities. This would have less ownership among the communities. Failures of such adaptation plans would cost the Government significant amounts for addressing the needs of communities in terms of recurring shocks.</p>
<p>Outcome 2.2 Increased</p>	<p>Rehabilitation of village water schemes is more cost effective than either (i) the no-go</p>	<p>An alternative approach would be to develop entirely new village-level water</p>

<p>benefits to community members through implementing adaptation plans and diversifying livelihoods</p>	<p>alternative, in which case water availability and food security would continue to decline in the targeted rural areas; or (ii) building new irrigation schemes. The estimated cost of rehabilitating village water schemes is USD877 per hectare.¹⁹² This approach also retains the cultural values of the existing village water schemes, which might be unquantifiable but are significant.</p> <p>The project's approach of carrying out catchment restoration above the village irrigation reservoirs that will be restored is cost effective as it will reduce maintenance costs and prolong the life of the reservoirs, due to reduced siltation that would otherwise result from the degraded land above the reservoirs. Moreover, land/catchment restoration per se has been shown to be highly cost effective. Globally, it has been shown that every USD invested into restoring degraded lands yields social returns, including both provisioning and non-provisioning ecosystem services, in the range of 3–6 USD over a 30-year period.¹⁹³ A similar range of returns from land restoration activities has been found in India.¹⁹⁴</p> <p>The project's agro-ecological approach to adaptation options and promotion of an integrated farming system leads to reduced input costs on an ongoing basis. The adoption of climate-resilient, nutritious and short-cycle crops that can cope with increasing climate variability will increase the amount of nutritious food available at the household level and thus reduce the amount of imported food that will need to be purchased.</p> <p>The project will promote the use of renewable energy, mainly solar energy, in the activities to reduce PHL and increase processing, as part of value chain development and livelihood diversification (Outcome 2.2).</p>	<p>reservoirs. However, this would be far more expensive: the capital costs of new major irrigation schemes are estimated at USD2,200 per acre of cultivable land. This approach would also require decommissioning and dismantling the existing village water reservoirs in some localities, as they occupy the best/only site for this purpose in the village. This would significantly add to the cost.</p> <p>An alternative approach would have been to not carry out land/catchment restoration above the reservoirs, thus reducing immediate project costs. However, given the existing levels of siltation in many village reservoirs as a result of soil erosion in the uplands, this would have represented an extremely short-term approach that would have resulted in not only greater costs to the village inhabitants in the medium-term, but also maladaptation; and thus this was determined to be indefensible for the project to adopt.</p> <p>An alternative would have been to not support project participants adopt an agro-ecological approach or integrated farming systems. In this case, input costs for fertilisers and pesticides, which are already unaffordable for vulnerable farmers, would continue to rise, rendering the livelihoods of these farmers not only not cost effective, but also not sustainable.</p> <p>An alternative approach would have been to either not provide support for energy-related activities, or to not support renewable energy. However, it has been proven that renewable energy is more cost effective on an ongoing basis than most other forms of energy. Moreover, if the project did not provide support for affordable energy for post-harvest processing, it is unlikely that this activity would have been sustainable – and thus the activities under Outcome 2.2 would not have been cost effective, as indeed</p>
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¹⁹² As quoted in the Mahaweli proposal submitted to the AF in 2013.

¹⁹³ Nkonya, E. et al., 2016a: Global cost of land degradation. In: *Economics of Land Degradation and Improvement – A Global Assessment for Sustainable Development* [Nkonya, E., A. Mirzabaev, and J. von Braun (eds.)]. Springer International Publishing, Cham, Switzerland, pp. 117–165.

¹⁹⁴ Mythili, G., and J. Goedecke, 2016: *Economics of Land Degradation in India*. In:

Economics of Land Degradation and Improvement – A Global Assessment for Sustainable Development [Nkonya, E., A. Mirzabaev, and J. von Braun (eds.)]. Springer International Publishing, Cham, Switzerland, pp. 431–469.

		they would not have been effective at all.
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E. Consistency with national or sub-national sustainable development strategies

The proposed project aligns with key government policies and strategies of both Sri Lanka and India in the area of agriculture (including fisheries), rural development and climate change adaptation, and gender equality. Achieving the project goal will directly contribute to achieving the targets of both Sri Lanka and India on Sustainable Development Goal (SDG) 13. The resulting improvements of community resilience, agricultural productivity and livelihoods will contribute to national SDG 2 targets, and are aligned with the Covid-19 stimulus / recovery aims of both countries¹⁹⁵, as stated for example in the UN Response Paper developed with the GoSL that highlights the importance of building resilience not only to the immediate effects of the pandemic but on a longer-term basis that includes building necessary institutional capacities.¹⁹⁶ In India, the response to support rural community resilience has been largely through increasing employment opportunities through the MNREGA programme¹⁹⁷; this project is consistent with this and will further develop more sustainable pathways for rural livelihood diversification.

India: The proposed project is consistent with India's National Action Plan on Climate Change (NAPCC) which was launched in 2008, and in particular with the national missions on Strategic Knowledge for Climate Change, Sustainable Agriculture, and Solar Energy. It also aligns with the National Water Mission and the National Livelihood Mission, the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), which aims to achieve convergence of investments in irrigation at the field level, and the flagship National Initiative on Climate Resilient Agriculture (NICRA). The project is consistent with the Second National Communication (SNC) to the UNFCCC, submitted in 2012, as well as with the 2021 third Biennial Update Report (BUR) to the UNFCCC. India's Nationally Determined Contribution (NDC) to address climate change prioritises additional forest and tree cover; and India has embarked on a global program to promote investment in solar energy by sponsoring the International Solar Alliance and is developing a global program on resilient infrastructure. India has given its strong commitment to meeting the SDGs. Its key major developmental programmes, the strategies for a 'New India' by 2022, and the country's vision for 2030 are aligned with the spirit of SDGs 2 and 13, amongst others.¹⁹⁸ The project is aligned with the State Action Plans for Climate Change (SAPCCs) of the states of Odisha, Tamil Nadu and Andhra Pradesh.¹⁹⁹ The emphasis on longer-term adaptation to heat stress is in line with the 2018 Heat Action Plan for Odisha.²⁰⁰ Further relevant sub-national strategies the project will contribute to include the Odisha SAMRUDHI-Agricultural Policy, 2020, which has a strong emphasis on adaptation to climate change and ensuring environmentally and socially sustainable agriculture and smallholder empowerment; the Tamil Nadu State Department of Agriculture and Farmers' Welfare Policy Note 2021-2022, particularly the promotion of millets and rehabilitation of minor irrigation reservoirs; and the Andhra Pradesh State Action Plan on Agriculture 2018-2019. The project is consistent with national gender equality and women's empowerment related policies/strategies/plans in India, including the National Policy for the Empowerment of Women, and will promote the achievement of relevant gender targets from SDG5 that form part of the SDG India index, including promoting equitable female/male labour force participation rates, as well as equal pay, in the project activities. The project is aligned with the National Youth policy of 2014 in terms of facilitating opportunities for youth skills development and entrepreneurship.

Sri Lanka: The project is aligned with Sri Lanka's national priorities for the three Rio Conventions, as set out in the National Biodiversity Strategic Action Plan 2016-2022 (CBD), the National Adaptation Plan for Climate Change Impacts in Sri Lanka 2016-2025 (UNFCCC) and the National Action Programme for Combating Land Degradation in Sri Lanka 2015-2024 (UNCCD). It is consistent with Sri Lanka's Climate Change Policy (2012), the National Climate Change Adaptation Strategy for Sri Lanka 2011-2016, and the National Disaster Management Policy of Sri Lanka. At the sub-national level, the project will contribute to divisional and village development plans that are consistent with these relevant national policies and strategies. Climate advisory services are strongly recommended in Sri Lanka's National Adaptation Plan, providing opportunities for future scale up and access to climate financing. Project actions are supportive of the Land Degradation Neutrality by 2030 (LDN) targets, particularly restoring and improving degraded forest (80% in the dry zone and 20% in the wet zone), reducing the rate of soil degradation to improve land productivity and Soil Organic Carbon (SOC)

¹⁹⁵ Note that neither country has put forward an overarching Covid-19 response policy document or programme, but has set out a range of intentions and targets for recovery from Covid-19 in various releases from different ministries.

¹⁹⁶ UN Advisory Paper: immediate socio-economic response to Covid-19 in Sri Lanka. June 2020.

¹⁹⁷ <https://www.brookings.edu/blog/future-development/2020/07/13/the-impact-of-covid-19-and-the-policy-response-in-india/> accessed 14/07/21.

¹⁹⁸ NITI Aayog (2019) 'Localising SDGs: early lessons from India 2019'. Specific examples are the flagship programmes of the government of India such as Poshan Abhiyaan (National Nutrition Mission), Aayushman Bharat (National Health Protection scheme), Beti Bachao Beti Padhao (Care for the girl Child) and Aspirational Districts programme, just to name a few, which directly address the challenges highlighted by SDGs.

¹⁹⁹ The MoEFCC issued guidelines to all states in 2018 for revision to strengthen the existing SAPCCs using recent scientific assessments and projections.

²⁰⁰ <http://www.indiaenvironmentportal.org.in/files/file/Heat%20Action%20Plan%20for%20Odisha.%202018.pdf> accessed 16 June 2021.

stocks, and reducing soil erosion of lands cultivated with annual and plantation crops. Moreover, the project will contribute to the implementation of government priorities as articulated in its Vision 2025, in the Public Investment Programme (2017–2020), in sector-specific strategies and plans of action, and in the United Nations Sustainable Development Framework for 2018–2022 for achieving Sustainable Development Goal 2. The proposed project advances the objectives of the Draft National Policy of Women by ensuring that gender considerations are effectively integrated in the design through meaningful consultations and gender analysis; and through equal participation and benefit from programme outcomes and supporting women and girls to increase their decision-making power. The project is consistent with the aims of building up youth agricultural entrepreneurs as stated in Sri Lanka’s Shared National Policy Framework of 2019.²⁰¹

At the regional level, the project will contribute to the Asia Regional Resilience to a Changing Climate (ARRCC) project and the Climate Adaptation and Resilience for South Asia (CARE) project, to facilitate rapid expansion and scale-up of successes and learnings. The project will also contribute to the realisation of the goals of the Regional Integrated Multi-Hazard Early Warning System (RIMES), the South Asia Hydromet Forum (SAHF), and the South Asia Seasonal Climate Outlook Forum, particularly with respect to enhancing national capabilities for hydromet functions and integrated agro-met last mile climate services, and in the promotion of vertical and horizontal knowledge exchange and learning from good practices.

F. Compliance with national technical standards

Implementation of this project will be governed by a range of national laws, policies, regulations and guidelines in Sri Lanka and India, including the overarching prescriptions emanating from the Constitutions, and the sustainable development and environmental management legislative and policy frameworks.

Environmental and sustainable development provisions emanate from the Constitution of India, which includes a directive to the State for protection and improvement of environment, and includes a fundamental duty on each citizen in Article 51-A (g) which states: “It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.” Sri Lanka’s Constitution imposes a similar fundamental duty of care on the State and all citizens and translates these provisions further in the National Environmental Policy (2003). The project will comply with all provisions of the environmental management framework legislation in both countries, as well as with the Environmental and Social Policy of the Adaptation Fund and the Environmental and Social Safeguards of WFP. In India, environmental legislation cascades down from the national Environment Protection Act of 1986, while in Sri Lanka the primary law is the National Environmental (Amendment) Act of 1988.

The project will comply with the relevant national technical standards for all of the adaptation activities under Component 2, not least those that involve catchment restoration and soil and water conservation activities, which may comprise silt traps, stone terracing, grass seeding, small dam rehabilitation or restoration of minor irrigation reservoirs. In India, such activities fall under various State departments, such as the Odisha State Department of Agriculture and Farmers’ Empowerment, the Department of Forest and Environment, and the Department of Water Resources, as well as any localised standards prescribed at the district level. In Sri Lanka, activities for conservation and development of water resources fall under the provisions of a range of departments and bodies as set out in the National Policy on Water Resources Development, Conservation and Management²⁰², including Irrigation Department, Mahaweli Authority of Sri Lanka, Central Environmental Authority, Department of Agrarian Development, and Provincial Councils/ Provincial Irrigation Department/ Municipal Councils/ Urban Councils. Forestry-related activities, such as small-scale planting of trees to protect micro-catchments above village irrigation systems fall under any prescribed standards of the Forest Departments of Odisha and Tamil Nadu in India, and in Sri Lanka, those falling under the Department of Forestry and the Department of Agrarian Development.

Regarding agricultural activities, such as demonstration of climate-resilient and short-cycle crops, good agricultural practices (GAPS), drip/ minor irrigation, vegetable/kitchen gardens etc., in India these fall under standards recommended by the Indian Council of Agriculture Research (ICAR), as well as packages of good practices of the respective States. The Bureau of Indian Standards (BIS) has developed a number of relevant standards, including Farm Irrigation and Drainage Systems, Good Agricultural Practices and Post-harvest Management Systems.²⁰³ In Sri Lanka, technical prescriptions for agriculture fall under the Ministry of Agriculture, and include guidance and technical standards on green agriculture and Good Agricultural Practices.²⁰⁴ The Sri Lanka Standards Institute (SLSI) has promulgated a number of relevant standards, including those governing agricultural irrigation equipment, and requirements for GAPS for different crops. The project will also comply with the National Guidelines for Climate Smart Agricultural Technologies and Practices for the Dry and Intermediate Zones of Sri Lanka, as published by the Ministry of Mahaweli, Agriculture, Irrigation and Rural Development in

²⁰¹ GoSL (2019) National Policy Framework: Vistas of Prosperity and Splendour.

²⁰² http://www.agrimin.gov.lk/web/images/pdf/15.08.2019_Draft%20Water%20Policy%20Full_English.pdf

²⁰³ https://www.services.bis.gov.in:8071/php/BIS_2.0/dgdashboard/published/new_subcommitt?depid=NjE%3D

²⁰⁴ See <https://doa.gov.lk/index.php/en/>

2019. Any processing of agricultural products will comply with the relevant food safety standards in each country. Regarding fish cultivation in farm ponds, the BIS has recently developed standards on fish, fisheries and aquaculture. The project will discuss with the SLSI whether there are any relevant standards for fish cultivation in small farm ponds. For provision of climate services, should the project provide any meteorological equipment, this will meet the standards prescribed by the BIS and the SLSI.

The project will comply with the above and any other relevant national standards, but will also adopt best practice international guidelines, for reducing vulnerability and promoting sustainable development while addressing climate change impacts. In this regard, the AF's environmental and social standards are invaluable and will be adhered to, as is further indicated in Section II.K, and in the project environmental and social management plan (ESMP) contained in **Annex 2**. Relevant national and international technical standards governing any cash-for-work activities that will be complied with include the following:

- Labour laws and standards in both countries, including those governing equal compensation for women and men
- GoI- Guidelines for National Rural Livelihood Mission (NRLM) and MGNREGA
- WFP – Harmonized Approach to Cash Transfer (HACT) Framework
- WFP – Cash Based Transfer (CBT) Manual
- WFP - Food Assistance for Assets Manual
- WFP – Cash Based Transfer (CBT) Financial Management
- IFRC - Cash Based Transfer Guidelines²⁰⁵
- International Organization for Standardisation – Cash for Work

The National Project Coordinator and Sub-national Project Implementation Committees (PICs), together with the relevant authority for each of the national technical standards, will be responsible for ensuring compliance with these during implementation. WFP will provide additional guidance and technical expertise. **Annex 9** contains additional information on compliance with national technical standards as they relate to all of the USPs in the Full Proposal. At this stage, the detailed information is only provided for India. It was not possible to gather this information in Sri Lanka at the time of finalisation of the FP due to the extremely challenging economic situation in Sri Lanka and the resultant impacts on all levels of society, including those of the Government departments. This detailed information will be gathered during the project inception phase and the additional details added to the ESMP where needed.

G. Avoiding duplication with other funding sources

There are several climate change-related projects and programmes operating or planned at the regional level and in the project localities. In order to find synergies and avoid duplication, the project team has actively sought out available information and held discussions with stakeholders. The AF project will build on/complement the projects set out in the table below, as indicated in the right-hand column.

Table 5. Measures to avoid duplication of project from other funding sources

²⁰⁵ <https://www.ifrc.org/Global/Publications/disasters/finance/cash-guidelines-en.pdf>

Project Title	Funding / institutions	Timeframe & regions	Specific locations	Key strategies	Complementarity with proposed WFP AF India/Sri Lanka regional project
REGIONAL					
Investing in CC Adaptation through Agroecological Landscape Restoration	ADB / Japan Fund for Poverty Reduction	Approved July 2020, runs for 3 years	Bangladesh, Cambodia, Myanmar, and the Philippines	USD2m for TA. Will promote agroecological landscape restoration and climate-resilient agricultural livelihoods in climate-vulnerable communities.	No geographical overlap. The ADB project will carry out analytical studies to inform adaptation policies and the preparation of investments in CC adaptation through the agroecological restoration. A representative from the ADB project will be invited to the inception workshop of the AF project so that relevant lessons from the ADB's project's implementation can be integrated into the AF project.
AVACLIM : Agroecology, Ensuring Food Security and SL while Mitigating CC and Restoring Dryland Regions	GEF / FAO	Approved Sept 2019. 3 years. India, Brazil, Burkina Faso, Senegal, Ethiopia, South Africa, Morocco		AVACLIM will provide reliable information on and advocate for the integration of the agroecology approach into development planning across drylands.	A representative from the AVACLIM project will be invited to the inception workshop of the AF project to identify possible synergies and ways to integrate the knowledge on agroecological approach generated by AVACLIM into the design of the AF project's sustainable agriculture / farming systems approach as well as into implementation of project activities.
Asia Regional Resilience to a Changing Climate (ARRCC)	DfID/ World Bank/ RIMES ²⁰⁶ / SASCOF ²⁰⁷ / UK Met Office; WFP/others support delivery	2018-2022 Regional platforms; national activities in Bangladesh, Pakistan, Nepal & Afghanistan.		Will deliver new technologies and innovative approaches to help vulnerable communities use weather warnings/forecasts to prepare for climate-related shocks, through improved access to CIS and EWS. Includes impact-based forecasting. ²⁰⁸ Will set up 3 regional bodies for seasonal and long-term climate projections/analysis and will work with NMHSs to design products for priority sectors.	No geographical overlap for national activities. <i>Potential</i> lessons from the work in Nepal on better use of seasonal forecasting in the agricultural sector will be explored during implementation, through the regional platforms. Potential regional synergies will be harnessed through interactions with the WMO-supported South Asian Seasonal Climate Outlook Forum (SASCOF) and Climate Services User Forum (CSUF), The SASCOF/CSUF event supports one NHMS person and one user sector from each South Asian country to attend this forum. The AF project will support additional participants from India and Sri Lanka to attend this forum, including community members who have been involved in co-production and dissemination of LMCS in the project localities, so that valuable lessons learned from the project's innovative activities on LMCS can be shared more broadly in the region.
Program for Asia Resilience to	UK funded / World Bank administered	2018-ongoing Afghanistan, Bangladesh, Bhutan, India,		Strengthen disaster and climate resilience. Key areas include (i) South Asia Hydromet	The AF regional project has further explored opportunities for regional coordination and leveraging of activities with the SAHF and SACARP, during development of the full proposal. While PARCC is a

²⁰⁶ Regional Integrated Multi-Hazard Early Warning Systems

²⁰⁷ South Asian Seasonal Climate Outlook Forum

²⁰⁸ CARISSA work package deals with longer-term climate projections; SCIPSA work package deals with development and downstream use of seasonal climate information - including the SCOS, or seasonal climate outlook statement, co-produced with communities.

Climate Change (PARCC)		Maldives, Myanmar, Nepal, Pakistan, and Sri Lanka		Forum (SAHF) ²⁰⁹ ; (ii) TechEmerge Resilience India Challenge - solutions using emerging/disruptive technologies; (iii) South Asia Climate Adaptation and Resilience Partnership (SACARP); (iv) Managing Fiscal Risks Associated with Climate Change	short term project (6 months) as per the project timeline, the project will engage with the SAHF which is an ongoing institution. The project will support participants from user sectors to participate in SAHF Annual conferences and webinar series organised by RIMES, to facilitate real-time sharing of lessons learned from the project's activities on co-development of LMCS.
Climate Adaptation and Resilience for South Asia (CARE)	World Bank / RIMES / Asian Disaster Preparedness Center (ADPC) Funded under PARCC.	Approved May 2020. 5 yrs.(USD39.5m) Regional platform. Detailed activities in Bangladesh, Nepal, and Pakistan.		Will develop public domain platform: Regional Resilience Data & Analytics Service, with information on weather hazards, climate variability & sector-specific data for policymakers. Will <u>develop guidelines for mainstreaming CC</u> in finance, agric, water, transport. ADPC established Climate Adaptation Platform South Asia (CAP-South Asia) for regional MSH dialogue; first regional policy dialogue held 9 December 2020.	The AF regional project will address key common adaptation challenges in implementing the Paris Agreement in the region, as identified by CAP-South Asia. Regional forums established under CARE will be used to promote vertical and horizontal learning, particularly around the innovative co-production of tailored agro-hydromet advisories for different groups on the ground, and their dissemination and scaling up. The AF project will support community members and national technical staff involved in the project's LMCS activities to participate in the CARE project's webinar series entitled 'Innovation in Climate Adaptation and Resilience', which is convened by RIMES and ADPC ²¹⁰ , and potentially the 'Climate Talks' series of webinars organised by ADPC.
SRI LANKA					
Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management	GCF (\$38m grant) / UNDP / Ministry of Mahaweli Development and Environment	Under implementation, 2016-2024	Northern & Eastern Regions	The GCF project is improving community irrigation water infrastructure, scaling-up decentralized drinking water systems and climate-smart agricultural practices in three river basins, and strengthening early weather warnings, flood-response, and water management. It will co-develop and disseminate weather- and climate-based advisories for agricultural and water management through ASCs and FOs to farmers and village water managers.	The GCF project focuses specifically on drinking water systems, which is not a focus of the AF project. Duplication regarding village irrigation systems will be avoided through working in different localities. Discussions will be held during the inception phase in Sri Lanka so that the AF project can build on and further develop the GCF's work in co-developing agro-met advisories (budget of USD2 million), and harness efficiencies, e.g. using similar service providers if possible.

²⁰⁹ The report from this forum is useful for summarizing priorities for regional collaboration.

²¹⁰ <https://www.adpc.net/igo/contents/Media/media-news.asp?pid=1782> last accessed 30/06/2022.

Strengthening the Resilience of Post Conflict Recovery and Development to Climate Change Risks in Sri Lanka	GEF SCCF / UNDP / Ministry of Economic Development, Ministry of Environment	2013 - 2018		Aim is to increase resilience through integration of climate smart policies and actions into rural development planning and budgeting	AF project will build on mainstreaming of climate change into district, divisional and village development plans developed during this GEF project, and will use the climate-resilient village economic development plans as an input into community adaptation plans, should there be any overlap of districts.
Addressing Climate Change Impacts on Marginalized Agricultural Communities Living in the Mahaweli River Basin of Sri Lanka	AF / WFP / Ministry of Environment/ Ministry of Agrarian Services and Wildlife	Approved 2013 MTE 2018		Addresses specific vulnerabilities faced by rain-dependent farmers; strategies to overcome dry season food and income security; introduction of diversified income sources to broad-base risk, improved water storage and irrigation to overcome uncertainty of rainfall, improved soil quality and fertility for increased production, and timely, quality agriculture advice and extension.	The AF project has been designed to build on lessons learned and address issues identified in the evaluation of the AF Mahaweli project. Specifically, WFP is implementing a strategy to strengthen the M&E systems for the projects that it supervises. This includes having a stronger focus on M&E in the full proposal development stage, with sufficient specific budget earmarked for M&E activities, including staffing. WFP will build this approach with a higher number of field associate positions for field level monitoring in future projects. A robust Complaints and Feedback Mechanism is currently being rolled out across all WFP interventions. WFP has trained field officers on corporate M&E standards; and is conducting diligent follow up and regular monitoring on all on-going projects to meet those standards. The AF Regional project's M&E system has been designed and sufficiently resourced to address the above points.
Sri Lanka: Smallholder Agribusiness and Resilience Programme (SARP)	IFAD / WFP / UNDP / Ministry of Agriculture	2019-2027	Project area: Mannar, Vavuniya, Anuradhapura, Puttalam, Kurunegala, Matale	Build resilience and market participation of rural households in geographical areas affected by climate change	WFP will intervene in Anuradhapura, Mannar, Matale for: Climate Risk Analysis consultancy; b) preparation of E&S Mapping Framework; c) VAM targeting & planning. SARP will also partner with WFP, "Building Resilience Against Recurrent Natural Shocks through Diversification of Livelihoods for Vulnerable Communities in Sri Lanka" project through entrepreneurship capacity building, strengthening services of Agrarian Service Centres & Agrarian Banks and linking entrepreneurial FOs to private sector buyers. The AF Regional project will have the districts of Mannar, Vavuniya, and Kurunegala in common with the IFAD project. WFP and IFAD will hold discussions during the inception phase of the AF project to determine whether there are any common localities and proposed climate-resilient value chains in the two projects, in which case synergies will be developed between project activities, particularly with respect to the facilitation of market linkages.

INDIA					
Andhra Pradesh Drought Mitigation Project (APDMP)	IFAD	2017-2022 Andhra Pradesh	Located in 5 driest districts: Anantapur, Chittoor, Kadapa, Kurnool and Prakasam	Includes providing farmers with information on weather, markets and cropping options, along with promotion of climate-resilient agricultural practices. 105 climate information centres (CLiCs) established. As of 30 August 2020, 12,155 farmers have used the CLiC centres, for weather related information. MOU between APDMP and ANGRAU entered in August 2019, and activities to enhance capacities of CLiC are planned.	The AF project has one overlapping district with the APDMP, namely Kadapa, and will determine during the inception phase whether there is an overlap with the localities of the APDMP. Should this be the case, the AF project will facilitate linkages between the project beneficiaries and the relevant CLiCs, which would become key partners in the co-development of LMCS under the AF project. Lessons learned from the APDMP's work with farmer producer organisations (FPOs) ²¹¹ will be integrated into the AF project, as common existing district execution structures will be utilised, as well as the APDMP's tie up with markets and finance institutions. The AF project will leverage the CLiCs established under this project to systematically develop the tailored climate advisories through co-creation with communities during implementation of the AF project.
Odisha PVTG Empowerment and Livelihoods Improvement Programme	IFAD	2016 – 2024 Odisha	17 Micro Project Agency (MPA) in 12 districts ²¹²	The goal of the project is to achieve enhanced living conditions and reduced poverty of target households. Key interventions include: (i) Community empowerment; (Incl. rural finance services); (ii) Natural Resource Management and Livelihoods enhancement; (NRM, Food and nutrition security) and (iii) Community infrastructure & drudgery reduction	The AF project will not work in the same localities as the IFAD project but will learn from and build on the institutional development in its work with PVTGs. Potential synergies with respect to NRM and livelihoods enhancement will be harnessed through discussions with relevant govt. agencies and service providers during the inception phase of the AF project, by inviting a representative from the IFAD project to attend the AF project's inception workshop.
Green-Ag: Transforming Indian Agriculture for Global Environmental Benefits & Conservation of Critical Biodiversity & Forest	GEF / FAO	2018-2025 National plus platforms in Madhya Pradesh, Mizoram, Odisha, Rajasthan, and Uttarakhand.	Mayurbhanj	Will strengthen national and state level institutions and agricultural programmes (missions), including mainstreaming of CC. Project community-level outcomes and SLM (including organic farming and agrobiodiversity conservation) will be measured through Green Landscape monitoring programme. A target Green Landscape of 175,000ha is planned for Odisha.	It does not appear that there is any overlap of localities with the Green Landscape proposed for Odisha under the GEF project. This will be confirmed during the inception phase of the AF project, and discussions held so that the AF project's agri-ecological approach under Component 2 can be harmonised with the GEF project's approach to SLM, organic farming and agrobiodiversity during implementation. The focus is on Simlipal, which is not the geographic focus of the AF project.

²¹¹ As of August 2020, 105 FPOs with 72,022 members are operational. 103 FPOs have received seed license to sell improved seed varieties and 28 FPOs have received fertiliser license. FPOs also run custom hiring centres and rent out mobile irrigation equipment.

²¹² Malkanagiri, Rayagada, Angul, Deogarh, Ganjam, Nuapada, Keojarh, Sundergarh, Gajapati, Kandhamal, Kalahandi and Mayurbhanj

Sustainable and resilient livelihood options for rain-fed areas of India (NRAA)	FAO	2019-2021 Maharashtra, Rajasthan and Odisha	Specific districts in Odisha, Rajasthan and Maharashtra	Increased farmer incomes and improved resilience through sustainable livelihood models developed for rural rain-fed areas	The FAO project has now closed but the AF project will build on the activities carried out under the FAO project should there be a geographical overlap with the district of Nuapada in Odisha, and provide further opportunities for any common beneficiaries to further implement their identified adaptation options.
Transforming Rice-Wheat Food Systems in India (PPG)	GEF-FAO	2021-2027 Punjab, Haryana, Odisha and Chhattisgarh	Specific districts in Odisha (TBD)	The project will greatly accelerate India's efforts to evolve a new model of sustainable agriculture that goes beyond current resource intensive rice-wheat cropping systems, to transition towards ecologically functioning and healthy landscapes and ecosystems.	During the inception phase, the AF project will harmonise its agri-ecological approach and promotion of integrated farming systems under Component 2 with the GEF project's emphasis on ecologically functioning ecosystems during implementation. There is not expected to be any geographical overlap in project localities.
Climate Proofing of Watershed Development Projects in the States of Tamil Nadu and Rajasthan	AF / National Bank for Agriculture and Rural Development (NABARD) (IE) /	Approved 2015 Tamil Nadu and Rajasthan		Soil and water conservation; Increased adaptation to climate change through climate resilient farming system approach and diversification of livelihoods; Integration of risk mitigation products like crop, weather and market advisory for the farmers; Creation of knowledge management system for climate proofing of watershed project and livelihoods	While no geographical overlap is planned, the AF project will build on lessons learned from this earlier AF project. It will particularly determine whether it is possible to build on and further develop the knowledge management system for climate proofing of watershed project and livelihoods, during the project inception phase and early implementation when the AF project's knowledge management system is developed.

H. Learning and knowledge management

Developing targeted knowledge and using this to enable and scale up an evidence-based approach to implementation of community-based adaptation is a central element of the project's strategy. To promote systematic learning and dissemination of this, the project will develop a learning and knowledge management (L&KM) strategy under Component 1, which will set out how feedback loops for iterative horizontal and vertical learning will be established to promote efficient and effective project operations, as well as how the innovative approaches and activities of the project will be documented and shared externally. The learning and knowledge management system for the project will promote the gathering, sharing, and utilising of knowledge related to the project's activities across departments and project components, and between countries, as well as regionally. While important for the project's internal functioning and sustainability, this will also help to address the common problem of compartmentalisation of government departments and what may sometimes be a culture of reluctance to share information and resources. The L&KM strategy will include appropriate knowledge products to be developed where necessary – for example, policy briefs that describe the process of developing participatory LMCS.

The project design has already integrated lessons from the LMCS pilot project in Sri Lanka and will continue to integrate other successful examples of piloting targeted climate services initiatives in India during implementation, as well as lessons from the planning and implementation of adaptation solutions in dryland areas in the region. An innovative aspect of the project will be to develop a model for institutionalisation and scale up of gender-sensitive LMCS, considering the learning from the implementation. Far from detracting from the implementation of concrete adaptation activities, this more systemic element is of critical importance for the sustainability of the project. Thus, it will be necessary to carefully document and disseminate valuable lessons learned, as well as systematic approaches developed. A number of specific project elements for which evidence will be generated have already been identified during full proposal development; these include evidence of the cost effectiveness of rehabilitation of village water schemes, as well as evidence of the increased income for poor smallholder farmers that can be enabled through restoration and climate proofing of watersheds and village irrigation systems. The project will partner with local research institutes and universities to generate robust evidence to substantiate its approach and activities. Appropriate knowledge products on these and other topics will be developed to enable wider dissemination and impact.

The regional approach of the project is key to cost effective learning and knowledge transfer and scalability. The project will leverage and support existing regional forums for knowledge and information sharing on LMCS and resilience to allow exchange of experiences, best practices and lessons learned on adaptive sustainable practices and delivery of last mile climate advisory services across both countries and among communities. The two countries will share expertise and technical support to develop common strategies and allow collective learnings to address cross-boundary climate change challenges experienced in the dryland areas, which have been so far addressed separately, such as improved water management through rehabilitation and de-siltation of village water reservoirs and irrigation channels, enabled through ecosystem restoration. The project will assist both countries to learn from each other, sharing strengths and knowledge, and optimising resources to generate solutions for poor rural communities. By developing internal project mechanisms for cross-border sharing of institutional and community-level knowledge and experiences, and by nesting these mechanisms in the existing regional forums for external learning, the project will set the ground for scale-up at national and possibly more broadly across the South Asian region. The national and regional feedback loops will be windows from which the impact of adaptation solutions informed by targeted climate services can be assessed, adding to wider learning within and between participating institutions, as well as more broadly.

During the inception phase, further details of the project's approach to learning and knowledge management will be elaborated and the project's learning and knowledge management (L&KM) strategy developed under Component 1 through further consultations with key stakeholders and community members in the targeted localities.

I. Consultative process

National- and state/provincial-level stakeholder consultations were carried out in both countries with a range of institutions from government, academia/research, private and NGO sectors. Two rounds were carried out in each country, one to develop the Concept Note and a second round during full proposal development.

In India, consultations at the national and state level were carried out to develop the Concept Note primarily in late January and early February 2021, with additional meetings taking place in April and May. For the full proposal development, stakeholder consultations were carried out primarily between February and May 2022. The project team met with different national ministries of the GoI, including Ministry of Environment, Forest

and Climate Change (MoEFCC), Ministry of Agriculture and Farmers Welfare (MoA&FW), Indian Meteorological Department (IMD) in the Ministry of Earth Sciences (MoES), and the National Rainfed Area Authority (NRAA). In Tamil Nadu, the team met with the Department of Environment (DoE), Fisheries Department, Food and Agriculture Organisation (FAO), the Centre for Climate Change and Disaster Management (CCCDM) in Anna University, Panchayath heads, block development officers and agricultural officers, District Development Manager of NABARD, various staff of Krishi Vighyan Kendra, Dharmapuri, etc. In Odisha State, the team met with Department of Agriculture and Farmers' Empowerment, Fisheries and Animal Resources Development Department, Department of Co-operation, Odisha State Disaster Management Authority, National Bank for Agriculture and Rural Development (NABARD), Regional Centre for Development Cooperation (RCDC), Oxfam, Odisha University of Agriculture and Technology, CTRAN (NGO/think-tank), Block development officers, horticulture officers. In Andhra Pradesh, participating stakeholders included a range of agriculture and extension services officials at different levels, research institutions (e.g. Soil Conservation and Training Institute), NGOs, community facilitators, and the Andhra Pradesh Drought Mitigation Project (APDMP). In India, a total of 63 expert stakeholders' interviews were conducted across 19 departments and organizations, and approximately 10 consultations were undertaken with Government ministries or departments at various levels.

In Sri Lanka, after an initial meeting at the Climate Change Secretariat (CCS) in February 2021, consultations at the national and provincial level were carried out in April and May 2021 to develop the Concept Note. For the full proposal development, stakeholder consultations were carried out primarily between February and May 2022. At the national level, the team met with the Ministry of Health (MoH), Ministry of Foreign Affairs (MFA), National Planning Department and Department of External Resources within the Treasury, Ministry of Agriculture (MoA), Ministry of Samurdhi Development, Ministry of Forest Conservation (MFC), and the National Aquatic Resources Development Authority (NAQDA). Meetings were also held with the Department of Meteorology, DoA, the Department of Agrarian Development (DAD), the Department of Export Agriculture (DEA), Department of Irrigation, Department of Animal Health and Production. At the district level, stakeholders included Agrarian Development Officers, Assistant Commissioners of Agrarian Development, and Agrarian Service Centres.

Key issues that arose during the stakeholder consultations were (i) Agreement on climate change impacts affecting the project areas in SL and India, including increased temperature, delayed monsoon and erratic rainfall, with more intense rainfall events, increased frequency of cyclones, floods, heatwaves and droughts leading to food and water security concerns, and increased soil and water salinity as direct climate risks, as well as poor human health and impacts on ecosystems; (ii) Consensus across the project areas on critical environmental and other challenges facing the agriculture sector, including an increase in the proportion of fragmented and marginal holding of land, poor management of water use, lack of rural and market infrastructure, price instability and rising cost of farm inputs, high rates of ground water exploitation, and rapidly declining natural resources; (iii) the need for knowledge, strategies and approaches that enable vulnerable communities to cope with climate change and adapt to the impending impacts, combined with climate literacy and advocacy; (iv) insufficient attention paid to current and future impacts of heatwaves – more awareness and adaptation needed on heat stress; (v) strong agreement across institutions and countries on proposed focus on tailored last mile climate services, with more attention to advisories for variability and slow onset climate conditions; (vi) training of ground-level agriculture officials and other service providers on co-developing national agromet advisory to the local level is needed; (vii) need to identify specific information dissemination channels so that marginalized and vulnerable farmers, especially women smallholder farmers, have appropriate and useable access to targeted information – how can ICT be used to enable and scale up CS for the vulnerable?; (viii) important to adopt an ecosystem-based adaptation (EbA) approach, which should be systemic as well – for example, NRM/watershed management; (ix) water stress / management is a critical issue, including reduced use of irrigation through tanks and canals (due to erosion/siltation) and thus more pressure on groundwater, as well as need to protect the health of farming communities against heat stress; (x) support for promotion of integrated farming system including livestock with range of components: crop production, farm pond, kitchen garden, pisciculture, poultry, apiculture, vermicompost, duckery, etc., but needs to take into account vulnerability to drought exposure in inland water fisheries; (xi) range of agricultural adaptation technologies proposed e.g. climate-smart irrigation, drought- and flood-resistant varieties, good agricultural practices (GAPS), traditional methods of pest control; (xii) farmgate level processing and marketing necessary, as is livelihoods diversification, especially for women, and increasing access to timely and adequate credit to farmers; (xiii) adaptation technologies to address deterioration of air quality, forest depletion and human-wild animal conflict; (xiv) consider when planning adaptation options: rural-urban migration and psychosocial concerns (farmer suicides); (xv) support for clearly stated sustainability / eco-agriculture approach to promote and maintain ecosystems, rejuvenate forests, integrated farming systems, ensure biodiversity, increase farmers' awareness of link between forests, climate, agriculture and food security. An interesting finding from Sri Lanka was that in some districts the

number of youths engaging in agricultural activities has increased recently, due to the expectation of a substantial income from farming as the prices of agricultural products are rising. They are educated on climate change and increasingly interested in green farming to overcome climate change problems and hopeful of receiving relevant training and guidance.

National validation processes were carried out in both countries for both the Concept Note and the Full Proposal. For the Concept Note, in Sri Lanka a stakeholder meeting was held on 16 July 2021, which was chaired by the CCS and attended by 15 national-level stakeholders from seven departments of the GoSL. Minor comments were received and integrated into the CN. In India, the draft CN was shared with all key stakeholders for their feedback and concurrence. Led by the MoEFCC, the feedback was sought from the Ministry of Rural Development, MoES (IMD), MoA&FW, State Governments of Odisha and Tamil Nadu. All partners appreciated the necessity of the initiative; their feedback has been incorporated.

During Full Proposal development, a Regional Technical Validation Workshop was held in Delhi, India from 21-22 June 2022, with the objectives to (i) bring together Government stakeholders from Sri Lanka and India to discuss, further develop, and forge synergies needed to finalise the regional Adaptation Fund proposal; (ii) agree the project activities, Implementation Arrangements, M&E system, and fundamentals of the budget; and (iii) enhance technical input into the draft proposal and agree regional-level approach, synergies and activities. The workshop was attended by high-level and technical representatives of both Governments: 10 from the GoSL, of whom four were women; and 9 from the GoI, of whom one was a woman. From Sri Lanka, participants included the Additional Secretary of the Ministry of Environment, the Acting Director of the Department of Meteorology, and the Directors General of the Ministry of Foreign Affairs, the Department of National Planning, and the DAD. From India, participants included the Senior Scientists and consultants of the MoEFCC, the Principal Scientist of the Central Research Institute of Dryland Agriculture- Ministry of Agriculture and Farmers Welfare, and the National Mission Manager – Farm Livelihoods of the Ministry of Rural Development Deputy GM and Senior Scientist from IMD- Ministry of Earth Sciences. Participants discussed and made minor revisions to the activities and menu of adaptation options that were based on the detailed stakeholder and community consultations, after which these were validated by the group. The participants strongly endorsed the approach to restoration of the minor irrigation reservoirs with a catchment focus, as well as the need to promote an integrated farming system that included livestock and its gendered dimension, as well as the project's integrated farming approach were made into the project governance structure and implementation arrangements, the monitoring and evaluation plan, and the project results framework, after which the project team were able to finalise these important elements of the proposal.

After revision and completion of the proposal based on the discussions and agreements at the Regional Technical Validation Workshop, a final validation process was additionally carried out on the final draft of the Full Proposal in July 2022 in both countries, during which the Executing Entities validated and agreed to endorse the proposal after minor revisions.

Please see **Annex 4** for the list of stakeholders consulted at national and sub-national levels in Sri Lanka and India during Concept Note and Full Proposal development.

Two rounds of community consultations were carried out in the targeted dryland areas in both India and Sri Lanka, one during Concept Note and one during Full Proposal development, to understand the climate vulnerability and adaptation needs of community members. For consistency, each community received the same set of questions, centring around their livelihoods, perceptions and impacts of climate change, support from external agencies, and adaptation gaps and needs. Wherever possible, these were disaggregated for women, men, female youth, male youth, elderly people, and vulnerable groups. Some sub-national authorities and service providers were also present at these meetings. The community consultations during FP development for both countries took the form of focus group discussions (FGDs) in all of the identified districts, which were conducted an integrated part of carrying out several assessments, which have been used to develop the full proposal. The assessments included:

- Assessment of natural habitats, biodiversity and the feasibility of various climate resilient and nutritious crops in the targeted localities, with regard to traditional practices and beliefs
- Mapping of existing schemes and support structures for enhanced livelihoods and agriculture, food security- and their climate responsiveness in the targeted project localities
- Mapping the financial support services in the targeted districts that potentially provide microcredit, savings schemes, crop insurance, etc. in order to mobilize financial investments for climate proofing of livelihoods and village level infrastructures
- Analysis of agromet and hydromet advisories provided and capacities of the communities to translate that into action- the capacity gaps at various levels.

- Gender assessment

Given the restrictions and lockdowns associated with the coronavirus pandemic, and the need to prioritise the health and safety of staff and community members, field trips out to the localities in the eastern states of India and the dry zone of Sri Lanka had to be limited during the early stages of development of the CN.²¹³ Thus, in order to ensure as comprehensive an understanding of community-level vulnerabilities, impacts and adaptation priorities as possible, the primary data was supplemented with secondary community-level material, such as climate vulnerability and impact assessments, adaptation needs assessments, and existing project proposals that directly gathered community-level information. In India, three in-person community consultations were carried out in the eastern states of Odisha and Tamil Nadu, involving a total of 116 participants (60 women and 56 men). In Sri Lanka, it was possible to hold one in-person community consultation with a total of 34 participants (17 women and 17 men) in April 2021, before the Government of Sri Lanka (GoSL) instituted further restrictions in the light of the increasing coronavirus pandemic wave in South Asia. This information was supplemented by a village context analysis conducted in dry zone localities for the Last Mile Climate Services (LMCS) pilot project.

During full proposal development, the situation with respect to COVID-19 was easier in India and eight focus group discussions (FGDs) were held in different localities in Andhra Pradesh, with a total of 94 community members of whom 63 were women; eight FGDs in Odisha with a total of 75 community members of whom 38 were women; and eight FGDs in Tamil Nadu with a total of 72 community members of whom 46 were women. In Sri Lanka, community consultations were complicated by the worsening economic crisis and limited availability of fuel and electricity. Nevertheless, community consultations were carried out with a household survey of sample of 300 smallholder farmers, of whom 195 were women, including livestock farmers and fishers, across the six districts identified. Wherever possible in both countries, separate FGDs were held for women so that they had sufficient space to voice all of their concerns and priorities.

Community consultations noted that the high variability of rainfall, flash floods during the rainy season, heatwaves in summer, and intense coastal flooding and cyclones leave people with long periods of food shortage (Odisha). The multi-pronged nature of the situation was expressed well by participants from the Matale district, dry zone division of Wilgamuwa in SL, who stated that despite increased drought, they also experienced intense rainfall that contributed to flash flooding and soil erosion, affecting productivity; but that the quantity of rainfall received has diminished over time, while temperature increases are clearly felt.

The more detailed community consultations conducted during FP development in India indicated crop loss/failure at some point across all villages in the project localities due to climatic factors, with drought and erratic rainfall being the most prominent in all cases. Untimely rainfall and monsoon failure, especially in kharif season, are contributing to fallow lands. Excessive rainfall is recorded to increase pest attack, thus further affecting productivity. Additionally, prolonged dry spells, heatwaves, and lack of water availability are considered major challenges by the women and men farmers. Besides climate, the decline in groundwater, lack of seeds, and soil fertility due to soil erosion have negatively affected agricultural production and yield growth. Farmers in Andhra Pradesh particularly reported that prolonged dry spells in the early stages of groundnut cropping results in crop failure due to less moisture holding capacity of the soil in the region. They also reported that erratic rainfall and droughts affect production of rainfed maize. The severity of climate impacts on agricultural productivity growth is recorded in the absence of adequate adaptation measures. For example, discussions during the FGD in the Dharmapuri district revealed that farmers still face the challenge of improving yield despite micro-irrigation availability, due to drought and erratic rainfall.

The more detailed community consultations conducted during FP development in Sri Lanka revealed that the climate in the project localities is undergoing three major types of changes: gradual increase in air temperature; changes in rainfall; and increase in frequency and severity of extreme weather events such as droughts, floods, and winds with slight variations across the districts in general. The climate change impacts pose considerable threats and badly affect agricultural production of smallholder farmers and thereby their livelihoods across the six study districts, with insignificant variations across the districts. However, some farmers are most affected by droughts than other impacts they experience, while others struggle more with the impacts of excessive rainfall that causes floods, and/or crop damage by wild animals.

Community members stated that they also experience the consequences of climate change on human health, through increased cases of asthma, respiratory allergies and airway diseases, cardiovascular disease and stroke, food-borne diseases and malnutrition, mental health, skin diseases for women, and water-borne diseases. Reduction in cropping area due to unfavourable climatic conditions leads to increased area under fallow, resulting in invasion of *Prosopis juliflora*; if the fallow period extends for more than a year, restoration

²¹³ The in-person community consultations were somewhat limited in terms of number of consultations, size, time and ability to have separate meetings with women, men, female youth, male youth, and vulnerable groups.

becomes a challenging practice (TN). Vulnerable groups, especially in landless labour communities, increasingly depend on non-farm employment, which is scarce.

Consultations revealed a reduction in the cropping intensity in some localities, from two crops to only one per year, which has affected the households' farm income and food security, leading to complete dependence on the rice distributed through Public Distribution System (PDS) (TN).²¹⁴ Participants in the Odisha consultations said that due to the shifting of rainfall patterns, the rabi season (crops sown in winter and harvested in spring) goes dry, and they cannot have a second crop. Community consultations conducted for full proposal development in both countries highlighted the importance of irrigation in enhancing the livelihoods of the smallholder farmers in the dry zones. In India, the consultations endorsed the findings of current studies indicating that irrigation plays a decisive role in enabling farmers to grow crops across multiple seasons and in providing opportunities for crop diversification. This can be illustrated by comparing villages in Andhra Pradesh and Tamil Nadu, which emerged to have better irrigation systems than villages in Odisha. Villages in Andhra Pradesh and Tamil Nadu have three cropping seasons, namely, kharif, rabi and zaid, while Odisha has only two seasons, kharif and rabi. Villages in Tamil Nadu and Andhra Pradesh exhibit more advanced irrigation systems like drip and sprinkler irrigation besides bore wells and dug wells. In Odisha, canals and streams are the primary sources of irrigation. Farmers from Rundi village in Odisha stated that lack of irrigation limits the cropping season only to kharif. Rabi crops could not be planted because of unavailability of or minimal irrigation systems.

Across the targeted dryland areas of the two countries, women and men farmers and agriculture labourers adopt diverse strategies to cope with negative impacts, including changing individual agronomic practices, e.g. to long-term crops like coconut intercropped with cowpea or groundnut; migration of men to non-farm sectors in other states/countries; increasing the number of goats and poultry to reduce the crop cultivation risks; diversifying homestead gardens with trees and vegetables for regular income by women; and seeking off-farm employment from government schemes by women, for example, India's MGNREGA. These decisions are also governed by changing socio-economic issues such as access to labour in households, etc. In Matale district, dry zone division of Wilgamuwa, in response to the lengthening of the food-insecure season, farmers sell valuables and productive assets as a coping strategy and also increase their indebtedness.

Despite the response of community members, more than 95 percent of households in a number of localities depend on the Public Distribution Systems, which only partially meet household food requirements; and on school feeding and supplementary nutrition schemes for pregnant/lactating mothers and children. They also borrow money, often from local money lenders, leading to increasing levels of indebtedness. Among vulnerable households, the educated youth leave for employment in nearby towns. In some areas, migration due to climate stress has become rampant (e.g. Puri district of Odisha). Participants have limited access to extension services, climate information, and awareness of entitlement schemes/services. Both rounds of community consultations highlighted that while farmers can access generic climate information through mass media (TV/radio), this is inadequate for existing livelihoods' challenges as it is not found to be accurate enough or to directly meet the needs of different kinds of farmers with different livelihood systems. In Odisha, mobile penetration is high, and people would like to receive relevant climate advisories. However, the Gender Assessment conducted during FP development in India revealed that many women do not have access to climate information and advisory services, and, as women do not have access to mobile phones, they could not hear the calls, and due to lack of reading skills they could not read messages. In Sri Lanka, a similar note of caution was raised, as mobile coverage is limited and there are almost no smartphones in the project localities. Nevertheless, there is a strong demand for targeted climate/agro-met advisories across the project localities, supported by targeted training and ongoing support to enable the use of the advisories.

Please see **Annex 4** for a list of national and sub-national stakeholders contacted, and **Annex 5** for additional detail on the community consultations.

J. Full cost of adaptation reasoning

Component 1

Baseline scenario:

Currently, agricultural production and related water security in the dry zones of Sri Lanka and eastern India is hampered by a lack of targeted weather, climate and hydrological information to use for local-level agriculture and village water management. Farmers do not currently receive targeted and localised forecasts

²¹⁴ This only meets partial requirements of a family (5 kg per head per month).

on which to base decisions about when and which crop varieties to plant. Similarly, water releases in the village cascade systems are not planned using localised early warnings of extreme rainfall, which would allow them to plan discharges and flood mitigation measures to limit damages to infrastructure. At the same time, men and women farmers in the project localities identified unpredictable monsoons, increasing drought and dry spells, shift in sowing period, excessive rain and flooding, and more heatwaves, as climate impacts that are already affecting them. While farmers in the project localities have expressed demand for better climate services, they currently do not have high levels of trust in them as they are too generic. In many cases farmers may not pay any attention to the climate services provided for instance on the radio or television. Thus their planting and other farming decisions are not informed by climate and weather forecasts and have high associated risks for crop loss and failure. While heat stress is increasingly experienced in the project localities, there is limited awareness of the need to also factor this into livelihoods' choices. At the community and district level, extension services providers and intermediaries currently have low levels of abilities and/or inappropriate information inputs to develop the kind of targeted and integrated climate and agricultural advisories that would assist community members to enhance and climate proof their livelihoods from season to season. Nationally, the hydro-meteorological services have expressed high levels of interest in but have limited or no experience of developing targeted and responsive LMCS, although they have considerable expertise in forecasting and related areas. Where projects have implemented climate services that are more locally targeted, these have been on an *ad hoc* basis and have not formed part of a system to institutionalise these within the government system, for greater sustainability and scaling out. The net result is a sub-optimal delivery of climate services to local communities, at a time when both gradual and acute climate impacts are accelerating and poor rural people are experiencing extraordinary added stresses on their livelihoods, due to the lasting effects of the coronavirus pandemic as well as the economic crisis in Sri Lanka.

Additionality:

By enabling last mile access to detailed, localised and up-to-date climate services, and making it easy to understand and readily actionable, the project will allow different groupings within the most remote and vulnerable communities to effectively plan and choose the most appropriate adaptation options for their specific context. As the LMCS will be tailored in terms of content as well as dissemination channels, they will be actionable by women and men farmers for different livelihoods systems. Climate services will be provided at different temporal scales, including seasonal, sub-seasonal, and *ad hoc*, in response to identified needs of community members. This will mean that different community members will have greater flexibility in their livelihood systems – they will not, for example, be limited to only the current predominant crop, which is usually paddy rice, but can consider which other options they might wish to plant – such as more nutritious crops like millets and legumes – depending on the actionable seasonal and sub-seasonal forecasts they will obtain. The risk of crop failure will be greatly reduced and women and men farmers will consequently be in a position to once again build up their asset bases as production increases and is more climate-resilient, and sustain their livelihoods into the future. Advocating for the Gol and the GoSL to develop an institutionalised system for LMCS, and providing technical assistance to facilitate this, will result in an ongoing basis upon which community members can continue to implement climate-informed adaptation decisions, not only in the project localities but also across different parts of the two countries. It will remove the need for subsequent projects to 'reinvent the wheel' in this regard. Lessons from developing the institutionalised systems will be shared regionally on an ongoing basis through identified mechanisms, resulting in potentially wider adaptation benefits in South Asia.

Component 2

Baseline scenario:

A critical constraint to developing effective and sustainable adaptation measures to address the current and future climate risks and impacts in the dryland areas of eastern India and Sri Lanka is the limited extent of knowledge of the adaptation options and technologies that would be appropriate in different contexts, as well as a lack of technical support for implementation of these. The livelihoods of rural dwellers are constrained by the environmental degradation and rapid shrinkage of natural resources upon which agricultural livelihoods depend in the project localities, which acts as a further barrier to effective local-level adaptation. The health and ecological functioning of land, surface and ground water, soils and biodiversity is declining, and rapid deforestation is leading to increased soil erosion, watershed degradation and loss of valuable ecosystem services such as water purification and flood control. Village water storage bodies are often dysfunctional or have significantly reduced effectiveness due to siltation. Direct climate risks that exacerbate environmental degradation include increased soil and water salinity, and vegetation changes due to increased average heat and drought incidence. Many poor and vulnerable community members are pushed into an ongoing cycle of coping which is leading to loss of productive assets as they struggle from one season to the next with different weather and climate impacts, exacerbated by external stressors such as macro-economic shocks, price increases and disease outbreaks, including the ongoing coronavirus pandemic. Moreover, community

members and vulnerable groups in general lack the financial resources to be able to implement appropriate adaptation measures on an ongoing basis, and also lack support and skills for value addition to increase household income from food production, as well as livelihood diversification away from agriculture. In the absence of knowledge of specific adaptation options that are tailored to local conditions and livelihoods as well as to the changing weather and climate, rural people continue to experience impacts such as poor human health, increased crop loss and indebtedness, increased cost of the food basket over the last decade, and an acceleration in rural-urban migration that further forecloses livelihood options. Deteriorating environmental quality and increasing rural-urban migration are likely to be further destabilising factors to the social, political, and economic equilibrium in the targeted areas.

Additionality:

Through the participatory development of climate-informed community adaptation plans to identify short- to long-term evidence-based adaptation strategies, and the support for implementation of identified adaptation solutions and livelihoods diversification, climate-related risks facing poor smallholders will be reduced. The productive assets developed under Component 2, such as erosion control and catchment rehabilitation above the village minor irrigation reservoirs, restoration of the functioning of those reservoirs, and implementation of the project's approach to sustainable and ecological agriculture, the natural resource base upon which local livelihoods depend will be enhanced. Local capabilities to resist weather shocks such as drought and flooding, as well as longer-term changes such as increased average temperatures and increasingly erratic rainfall, will be improved. These positive impacts will be further enabled through support for improved natural resource management, and training and technical packages to promote good agricultural practices (GAPs), towards sustainable and climate-resilient agricultural livelihoods. During awareness raising associated with the community adaptation planning, emphasis will be placed on the short- and long-term impacts of and potential solutions for the increasing heat stress – on humans, animals and vegetation – experienced in the project localities. Community members will be assisted to develop financial strategies to ensure long term sustainability of their adaptation plans, including through financial literacy training and increased linkages between community members and existing financial services. In this way, individuals and community-based organisations such as farmer groups can enhance their access to microcredit and saving products, as well as existing microinsurance schemes. This will help them to build their financial reserves and provide a way out of the ongoing cycle of coping and loss of productive assets experienced by many. To provide additional pathways out of poverty and towards climate resilient livelihoods, farmers (women, men, youth) will be trained and equipped to develop and implement diversified farm and non-farm livelihood options. This could include improved storage facilities, introduction of post-harvest technologies, and strengthening of market linkages. Farmgate level processing and marketing will focus *inter alia* on varieties like millets and pulses that are highly nutritious as well as climate resilient, and that have high potential for primary processing. As a result of this, farmers will be able to increase nutritional outcomes and food security for their families, as well as greatly improved household incomes, that are more diversified and therefore more sustainable.

K. Sustainability of project outcomes

Community consultation during the development of the Concept Note and of the full proposal, and community participation during implementation, is an important aspect of the sustainability strategy. Consultation and participation are important to ensure that the project components and activities directly address the adaptation needs of different community members, disaggregated according to gender, age group, livelihoods and vulnerability group, etc. It also assists to develop community members' ownership of the proposed intervention, which is critical to ensure that any assets developed are maintained beyond the life span of the project. Moreover, community interest and involvement will greatly influence government counterparts (hydromet agencies and others) to sustain the efforts. Strong participation on the part of affected communities is a thread that will run throughout the project. Under Component 1, this will be specifically stimulated through the participatory development of gender-sensitive last mile climate services to respond in a targeted fashion to the differentiated needs of different groups of poor and vulnerable people, and their varied livelihood systems in the project localities.

The project builds on lessons learned and activities implemented by the GoSL, GoI, WFP and their partners. This includes initiatives in Malawi, Tanzania, Niger, Senegal and Zimbabwe where WFP has expanded resilience building to include tools and knowledge to allow communities to prepare for, and deal with the impacts of climate-related hazards. In such projects, community consultations were key to deciding the approach and format of climate services involving the community, including religious and cultural leadership, so that the project outcomes are culturally acceptable and appropriate and therefore more sustainable.

Developing a system to institutionalise LMCS within two countries and share lessons regionally is an innovative way to sustain the benefits beyond the lifespan of the project. Many projects pilot activities in one particular place, with no provisions for institutionalization of any systems developed, and thus there are limited benefits post-project. Since this is a regional project with multiple implementation localities, this is an innovative way to sustain and scale out the project results. Both India and Sri Lanka currently provide climate services but with limitations as already set out elsewhere in this FP. Standard Operational Procedures for generating and disseminating Agromet advisories are available for India, which specify the various roles of the different stakeholders in the process. Similarly, in Sri Lanka, the flow of agromet information and coordination mechanisms of institutions at different levels, i.e., from national to end user level are documented, and technical steering committees exist at province and district levels. The roles of various institutions and their links are identified, however coordination mechanisms across the different stakeholders are not effective. The engagement of the end user/community in the process remains the greatest challenge. The bottom-up and evidence-based approach/system proposed by the project will ensure the end users/community are appropriately engaged to understand their information needs and decision contexts, and to promote co-development of agromet advisories that are tailored with greater relevance and utility. The ownership of end users/community in the co-development process of LMCS will promote their stronger engagement in the process, enhance their trust in using the products, and provide continuous feedback on the reliability of the products for further improvement. Such organic participation of end users/community will inherently lead to continuity of the programme and create a greater demand for information from various stakeholders at various levels for generating tailored agromet advisories. The two-way communication will help technical agencies such as Hydromet and Agriculture departments, to continuously improve the information feeding into agromet advisories. The active participation of the various stakeholders, continuity of the LMCS system, and evidence generation will inherently trigger interest within Government agencies to institutionalize and sustain the process. Further, sharing the lessons across these countries in a regional platform, will increase regional awareness on the importance of community centric co-development of agromet advisories. The evidence gathered by the project on the improvement of the livelihoods of the end users through this process will promote continuity and sustainability of such approaches, not just within these two countries, but also to expand beyond these two countries in the South Asian region.

Ensuring maintenance and sustainability of concrete assets developed is a critical element of the project's exit strategy. For all assets at the farmers' groups and community levels, the project specific agreements will be developed prior to implementation that spell out arrangements for (i) ownership; (ii) management; and (iii) maintenance, in the interests of sustainability. The exact modality for supply of any machinery – for example milling machines and solar dryers – will be determined during the inception phase, taking into account availability of maintenance in the area and accessibility in terms of costs. Provisions will be developed to ensure that women, youth and people with disabilities benefit equitably in any associated business opportunities. Where agroforestry is implemented or trees are planted under group- or community-management, formal agreements will be discussed during community adaptation planning and developed prior to implementation, that specify clear responsibilities for maintenance, so that trees are able to survive the first couple of years and beyond the time frames of the project.

The project will implement a range of activities to advance gender equality as needed for sustained results and climate resilience. These include the gender assessment carried out during project preparation to assess different needs and barriers of men, women, youth (female and male) and their intersecting identities (age, abilities, location, ethnicity, language, gender, social class), so that project activities can be designed to overcome these and to ensure that consultations at all levels were undertaken in a gender-sensitive manner. The system of gender-responsive, bottom-up, localised LMCS to be developed will ensure that climate and agricultural advisories are not only actionable in different localities and for different livelihoods systems, but also address the needs and access/capabilities of women farmers as well as men farmers. Under Component 2, during selection of concrete adaptation options, the project will promote gender equality through equal participation of different socio-economic groups such as women and youth (female and male) and their institutions (including local leaders and technical staff from government and partner organisations), to produce community adaptation plans that are relevant to their specific needs and context. The project's gender mainstreaming strategy as set out in Part III.A is a central element of the exit strategy.

Drawing on lessons learned from other projects in both countries, the project duration has been extended to five years, in recognition of the fact that at least six months are generally required at the outset for project inception and recruitment of staff, and that six months are required at the end for winding down the project and ensuring strong handover to relevant institutions. This is particularly important to accommodate additional complexities of a regional project while still allowing for sufficient time for the execution of specified activities for the project to meet its outcomes and is seen as important for its sustainability. While developing mechanisms for institutionalisation of the project approach towards sustainability are an integral part of the

project and spelled out in the activities, it is important to allow for sufficient time so that these mechanisms are adequately mature by the end of the project.

L. Environmental and social impacts and risks

The entire project was screened for environmental and social risks against the 15 principles outlined in the AF’s Environmental and Social Policy, as set out in the table below. The project is not expected to generate any significant environmental/social impacts or risks. Component 1 of the project entails strengthening capacities to ensure access to last mile climate services (LMCS) for vulnerable communities, disseminating the LMCS through tailored communication channels, supporting institutionalisation of co-produced LMCS, and promoting scaling out by leveraging regional knowledge sharing platforms. These activities are intrinsically risk-averse with respect to social and environmental impacts. Targeted LMCS and associated knowledge will be integrated into activities of Component 2, to provide a solid basis for climate-resilient asset creation and livelihoods diversification, through value-addition to agricultural products and associated entrepreneurial development. Concrete assets to be developed under Component 2 will be prioritised through community-based planning during project implementation.

Due to the unidentified sub-projects (USPs) of Component 2, the project is categorized to be “medium risk”, or category B. An Environmental and Social Risk assessment, in compliance with the ESP Policy of the Adaptation Fund has been carried out during project preparation and a risk management plan developed, with related indicators, budget, clear roles and responsibilities. Concrete adaptation options and assets will be small-scale and developed at household or community level, thus the project is expected to be classified as low or moderate risk. An Environmental and Social Management Plan (ESMP) (**Annex 2**) and a Grievance Mechanism (**Annex 3**) have been included in the full project proposal, as required by the AF and by WFP procedures. The ESMP outlines mechanisms for managing and tracking identified risks. Each USP will be then screened prior to implementation to identify potential new risks and adopt appropriate mitigation measures to be captured by relevant ESMPs for implementation, monitoring and reporting.

Table 6. Risk screening of the project based on the 15 principles of the Adaptation Fund’s Environmental and Social Policy and proposed mitigation measures

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>	X	Low/no risk: The FP has been developed to be in compliance with the legal frameworks of Sri Lanka and India. Relevant national, regional and district authorities have been consulted during proposal development and will continue to be consulted during project implementation to ensure compliance with all relevant laws.
<i>Access and Equity</i>		Low/moderate risk: The FP has been designed so that no activity will interfere with access to basic services or exacerbate existing inequities. Project activities to rehabilitate minor irrigation reservoirs will result in increased access to water for irrigation for the most vulnerable HHs. The project will put in place adequate measures to ensure equitable access to activities and assets by women, youth and vulnerable groups in project areas. In-depth consultations with communities and stakeholders have been conducted throughout proposal development and will continue throughout project implementation to ensure that any barriers to access and equity can be overcome in line with the AF’s ESP.
<i>Marginalized and Vulnerable Groups</i>		Low/no risk: The project has been designed to empower marginalised and vulnerable groups to make decisions on concrete adaptation actions, valuing their traditional and local knowledge, through the community adaptation planning process. Marginalized and vulnerable groups – including women, youth, the elderly disabled people, different castes and PVTGs - have been consulted during proposal development to ensure that their identified threats, priorities and concerns are duly reflected.
<i>Human Rights</i>	X	Low/no risk: The project and its intended activities do not risk violating any pillar of human rights. Project activities are designed to further the realisation of procedural and distributional human rights, including through the community-based adaptation planning process and through the emphasis on

		increasing equitable access to food, water and building livelihoods skills for climate resilience. The IE and its partners affirm the fundamental human rights of all people.
<i>Gender Equity and Women's Empowerment</i>		Low risk/moderate risk: At least 52 percent of the project beneficiaries will be women; this proportion will be higher for certain activities – for example, the mentoring and incubation of resilient rural entrepreneurs under Component 2, which will only be provided to women and youth. The project will fully mainstream gender and will ensure that women and men and female and male youth equitably engage in and benefit from project activities such as concrete asset building and climate-resilient livelihoods diversification. The project's gender mainstreaming strategy as set out in Part III.A is a central element of the exit strategy. A gender assessment has been conducted, and women and women's groups will be intensively consulted during further design in the inception stage and implementation of the project. The Gender Assessment recommendations have been integrated into the ESMP and will inform implementation. Factors influencing the discrimination against women in terms of access to land and labour force participation could pose some risks of women being excluded from the project's benefits in the long run. Appropriate mitigation measures have been included in the ESMP; these will be further investigated with respect to the project localities during implementation and any further corrective measures taken.
<i>Core Labour Rights</i>		Low/moderate risk: While child labour is not uncommon in the targeted areas, particularly in the agriculture sector, the IE and its partners respect international labour laws and codes, as stated in WFP's policies, and are committed to ensuring that core labour rights are met in any project. In particular, WFP has a zero-tolerance policy for child labour of children below 14 years. Working with the GoSL and the GoI, WFP will seek to promote school attendance, linking the beneficiaries' HHs to the school-based programme activities in the two countries.
<i>Indigenous Peoples</i>		Low/moderate risk: The Veddha indigenous people in Sri Lanka are found mainly in forested areas in the south-central regions, and thus it is unlikely any of the project localities will include this group. In Odisha, the project localities will include people from the PVTGs, and a Free, Prior and Informed Consent (FPIC) process will be sought during the inception stage of the project, when specific localities will be identified. A relevant Indigenous Peoples Plan will be elaborated and implemented in coordination with the project activities. The project will not discriminate against any group, and will ensure the widest participation from all different groups during all of its phases, from the design to the implementation.
<i>Involuntary Resettlement</i>	X	Low/no risk: The project is not expected to lead to involuntary resettlement, neither in physical nor economic terms. If such a risk will be identified through the screening exercise of USPs, adequate mitigation measures will be included in the ESMP/s and put in place as required.
<i>Protection of Natural Habitats</i>	X	Low/no risk: The project is not expected to impact negatively on any natural habitats. Rather, by implementing adaptation activities consistent with EbA, such as SLM and agroforestry, the project will ensure the protection of natural habitats. In addition, consultations with government stakeholders and communities will ensure that conversion or degradation of critical natural habitats (including those that are legally protected, officially proposed for protection, recognized for their high conservation value, or recognized as protected by traditional or indigenous local communities) is avoided.
<i>Conservation of Biological Diversity</i>		Low/moderate risk: Some activities of Component 2, such as agroforestry and promotion of new crop varieties, could potentially have adverse impacts on biodiversity, leading to a deterioration of biological diversity if species are not correctly selected (e.g. inadvertent introduction of invasive species) and diversified. The project will prioritize local species and multi-species planting and avoid the use of non-native and invasive species. These activities will be designed in close collaboration with relevant authorities and research institutes. As a result, the project is not expected to have any adverse impact on the environment or biodiversity. Moreover, these activities are of small-scale (managed at individual, household, or community level) and any residual impact on the environment or habitats would be negligible and readily remediable. They are not expected to have any negative cumulative impacts in either of the countries. On the contrary, the restoration of the catchment area and the reservoirs (Output 2.2.1) combined with Good Agricultural Practices and traditional adaptation measures (Output 2.1.1) is likely to cumulatively improve groundwater recharge and water retention in

		soils, as well as result in an overall healthier environment compared to each measure individually. Avoidance measures which will be adopted by the project are: i) No introduction of alien crop/plant species; ii) No activity in conservation areas and/or natural reserves
<i>Climate Change</i>		Low risk: The entire project is designed to reduce beneficiaries' exposure and vulnerability to the effects of climate change and increase their resilience. The project will not generate any significant emissions of greenhouse gases or reduce carbon sink capacity. Many project activities have been designed to be low-emissions, as well as adaptive – e.g. the increase in vegetative cover during rehabilitation of catchments above irrigation reservoirs, SLM asset building and promotion of renewable energy for any buildings that are developed/rehabilitated. As the project area is highly vulnerable to the impacts of climate change, all project components and activities have been designed to contribute to increasing local capacities to sustainably face long-term climate change, and short -and medium-term climate variability. The promotion of: i) good agronomic practices for better soil and water management; ii) Integrated pest management coupled with using organic fertilizers; iii) the increase of carbon sinks' potential through tree planting; and iv) promotion of integrated farming system, are expected to reduce agricultural emissions. Plants and crops will be selected for good adaptability to current/projected climate. Moreover the project will promote the use of renewable energy wherever possible – for example in the promotion of solar dryers to reduce post-harvest food waste and associated GHG emissions.
<i>Pollution Prevention and Resource Efficiency</i>	X	Low/no risk: None of the activities in the project will release pollutants into the air, soil or water. The project will not provide any agrochemicals, but rather will promote more environmentally sustainable methods while avoiding hazardous materials, or ozone depleting substances. Under Component 2, the project will introduce climate-smart agricultural practices, aimed at reducing the use of pollutants and increasing resource efficiency. These will include the promotion of the integrated farming system, promotion of natural/ low impact solutions to increase agricultural productivity (e.g. compost, agroforestry, organic production) and to combat pests (e.g. integrated pest management). Potential indirect impacts of improved access to water for irrigation and household use (Activities of Outcome 2.2) could be increased consumption of water for irrigation – through inefficient systems and scaling up – and other uses, including previously non-existent uses (e.g., car /motorcycle wash, pour-flush toilets). This could lead to continued strain on the hydrological system and for new uses may also lead to contamination of soil and water from non-agricultural sources. The project's awareness raising activities will include sensitisation on the need for pollution prevention and resource efficiency; and existing water governance structures will be strengthened. The project will only implement ecologically sound good agricultural practices and resource-efficient irrigation practices. Awareness raising and capacity development activities will include health-related issues such as good water, sanitation and hygiene protocols.
<i>Public Health</i>		Low/Moderate risk: The project is not expected to have any detrimental effect on public health. All project activities will be implemented in a Covid-19-safe manner, should the current pandemic still be impacting on the project localities when implementation begins. The emphasis on raising awareness of the impacts of and adaptation responses to heat stress can be expected to result in an increase in health outcomes. Project activities will promote increasing agricultural production and processing, and cultivation and consumption of nutritious crops, and thus will contribute to tackling the underlying causes of malnutrition. Particular attention will be given to activities related to water harvesting and storage, so that these do not result in an increase in vector-borne disease. Communities will be sensitized on using and storing water in a safe and efficient way. None of the activities in the project involves the use of equipment, materials or transportation that could pose a risk to community health or safety. The rehabilitation of multi-purpose minor irrigation reservoirs could potentially increase existing levels of transmission of water-born or water-based diseases, but this can be avoided by adding indigenous larvae-eating fish to the ponds. Also, depending on the level of depth, the water ponds may represent a risk of drowning for children. The multi-purpose use of water should be specified during implementation, and any practice, which could be risky for human health, should be discouraged as appropriate.

		Post-harvest storage facilities will be small-scale structures to be established mainly at households' level. Beneficiaries will be trained on correct hygiene practices to avoid any form of contamination or alteration and ensure good quality of the stored products. Mitigation measure: i) Add indigenous larvae-eating fish species that feed on mosquito larvae to the water ponds; ii) Awareness raising and signs indicating the risk of drowning and the water depths
<i>Physical and Cultural Heritage</i>	X	Low/no risk: The project is not expected to have any negative impact on physical and cultural heritage, but will rather contribute positively in this regard, in a number of ways. Component 1 will ensure traditional knowledge from local smallholders is valued and incorporated into LMCS through the co-production process. The rehabilitation of minor irrigation reservoirs (Component 2) will result in conservation of cultural heritage, as these are significant cultural artefacts. For example, the tank-based irrigated agricultural system in the Dry Zone of Sri Lanka is one of the oldest historically evolved agricultural systems in the world, which can be traced back nearly two millennia. ²¹⁵ During community adaptation planning, the project will seek to understand the role of traditional and local knowledge and how it can be blended with scientific information for climate resilience. Consultations and engagement with stakeholders and communities during implementation will ensure that any physical cultural heritage present on project sites is identified and potential negative impacts are avoided through project design.
<i>Lands and Soil Conservation</i>	X	Low/no risk: Project activities will not pose risks to land and soil conservation, but rather will be specifically designed to address land degradation and promote sustainable land management and erosion control. Afforestation activities will additionally support protection and enhancement of lands and soil. Component 2 will promote, amongst others, soil and water conservation management practices aiming at restoring degraded land and improving ecosystem-based services. All activities are of small-scale (managed at individual, household, or community level) and any possible residual impact would be negligible and readily remediable. There will be no physical transboundary impacts, as the project localities in the two countries are not contiguous but are inland areas separated by the Bay of Bengal.

The risks identified in **Table 5** have been further analysed during the environmental and social risks screening that is included in **Annex 2**. This includes a further consideration of indirect, transboundary and cumulative risks. Mitigation measures have been identified and are included in the Environmental and Social Management and Monitoring Plan (**Annex 2**).

Once the USPs of Component 2 are defined during project implementation, environmental and social risk screening will be carried out at community level and in consultation with the beneficiaries. Coordination with departmental environmental authorities will be duly sought by the implementers (see **Annex 2**, section 4). Activities with a medium or high risk will not be considered for implementation under Component 2. For locations with the presence of Indigenous peoples, a Free, Prior and Informed Consent (FPIC) process will be sought during the inception stage of the project, once specific localities are identified.

The Grievance Mechanism is described in **Annex 3**.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Project implementation arrangements

A.1. Arrangements for Project Management

The project will be jointly executed by the Government of Sri Lanka (GoSL) and the Government of India (GoI). In Sri Lanka, this will be under the overall supervision of the Ministry of Environment (MoE), which is the Designated Authority (DA) of the Adaptation Fund. The Ministry of Environment, through the Climate Change Secretariat (CCS) of the MoE, will have responsibility for the project execution, in collaboration with the Ministry of Agriculture, the Department of Irrigation, the Department of National Planning, the Department of Meteorology, the Department of Agrarian Development, and District Secretariats. In India, this will be under

²¹⁵ Abeywardena et al (2019), available at https://www.researchgate.net/publication/331036265_Indigenous_Agricultural_Systems_in_the_Dry_Zone_of_Sri_Lanka_Management_Transformation_Assessment_and_Sustainability

the overall supervision of the Ministry of Environment, Forest and Climate Change (MoEFCC), which is the Designated Authority of the AF. In India, the state governments of Andhra Pradesh, Odisha and Tamil Nadu will be responsible for the ground level implementation. The partner ministries closely involved in the project execution will include Ministry of Agriculture and Farmers Welfare, the Ministry of Rural Development, the Ministry of Water Resources (Jalashakti), and the Indian Meteorological Department.

WFP, as a Multilateral Implementing Entity (MIE) of the AF, will act as the fund custodian, with the WFP Representative and Country Directors of each country office acting as the Fund Managers. WFP will assume financial oversight of the project and report to and be accountable to the Adaptation Fund Board, to ensure that the project measures and achieves expected results, fulfils all reporting functions, and meets WFP and AF rules and regulations. The WFP Sri Lanka Country Office and the WFP India Country Office will oversee and coordinate the overall project management, as well as coordinate the processes of monitoring, evaluation and knowledge management. WFP will provide technical backstopping, fiduciary and managerial support throughout all stages of project implementation, as well as capacity strengthening of the government.

At the project formulation stage, during regional validation workshop and following discussions on project proposal with the two Executing Entities, it was suggested by Executing Entities in each country that WFP provides the direct project services for Procurement and Recruitment of staff. The justification for the same was that it will increase the efficiency and effectiveness, as the complex and bureaucratic process in both the governments can be averted. This will provide more focus of executing entities and the governments at various level on project implementation and reaching the services to communities more efficiently. WFP's presence in both the countries and audit compliant processes will help faster actions. It is agreed that the terms of references and specifications will be agreed between WFP and the EE before undertaking any such direct project services. The final project proposal was submitted to both governments and reviewed in detail before the Designated Authorities signed the Letters of Endorsement for the project, thus all the provisions included hereto in the proposal, including implementation arrangements, are considered approved by the two governments.

WFP is not charging any cost for providing these services and will contribute through existing structures in both the country offices. Procurement and HR officers time will be covered by WFP as a contribution to the project.

Thus, in Sri Lanka, the MoE and WFP have agreed that for smooth and efficient functioning of the project, key processes are to be undertaken by WFP, including:

- a. **Recruitment support:** Based on agreed ToRs with the Executing Entity, WFP will facilitate hiring of staff for the National Project Management Unit (NPMU) and the district-level District Implementation Managers, subject to recruitment circulars of the Government. The National Project Co-ordinator, Communications & Reporting Associate and Business & Finance Support Assistant will be based in the NPMU. The District Implementation Managers will be based in the respective district government offices with basic office facilities and will report to the respective District Project Implementation Committees and to the NPMU/Executing Entity.
- b. **Procurement:** Procurement of equipment, materials, goods and services will be facilitated by WFP as per procurement requests by the GoSL.²¹⁶ For hiring implementation agencies, research agencies and other services, the ToRs will be validated by GoSL. The Department of Treasury Operations (TOD) will receive funding for GoSL-executed activities pursuant to a Letter of Understanding between the GoSL and WFP, with the WFP Project Management Secretariat (established for overall coordination of WFP projects located at the Ministry of Finance) coordinating the project.

In Sri Lanka, the costs and other details of project execution activities to be executed by the GoSL, such as trainings, awareness activities, meetings and workshops will be specified in the Letter of Understanding (LoU) and will be aligned to the inception document shared and endorsed at national level upon approval of the project at inception phase. Funding for activities executed by the GoSL will be transferred through the Department of Treasury Operations (TOD) in line with the Letter of Understanding between the GoSL and WFP.

Project execution and facilitation will be undertaken at the sub-national (district) level. The MoE as Executing Entity will facilitate this process through timely concurrence on the workplans, annual budget, job descriptions for hiring staff of the National Project Management Unit and the District Implementation Managers, the Terms

²¹⁶ All procurement will be carried out under rules that are equivalent to WFP's procurement rules.

of Reference for technical consultants, research and evaluation, and other relevant project implementation activities in consultation with WFP so that project milestones are reached effectively.

In India, WFP as MIE will receive the funds and will be responsible for fund management as per AF rules. This includes preparing financial reports and coordinating progress reporting at the required frequency, commissioning and managing evaluations, and the end of project financial audit. The MoEFCC and WFP have agreed that based on an approved Annual Workplan and Annual Budget requirements, the required funds will be disbursed to the three project states for state level implementation. For this, separate MoUs/LoAs will be developed between WFP and the three project states to agree on the modalities. A bank account will be opened in each state for fund transfer and expenditures. The MoEFCC and WFP have agreed that for smooth and efficient functioning of the project, WFP would provide some direct project services. Key processes to be undertaken by WFP include:

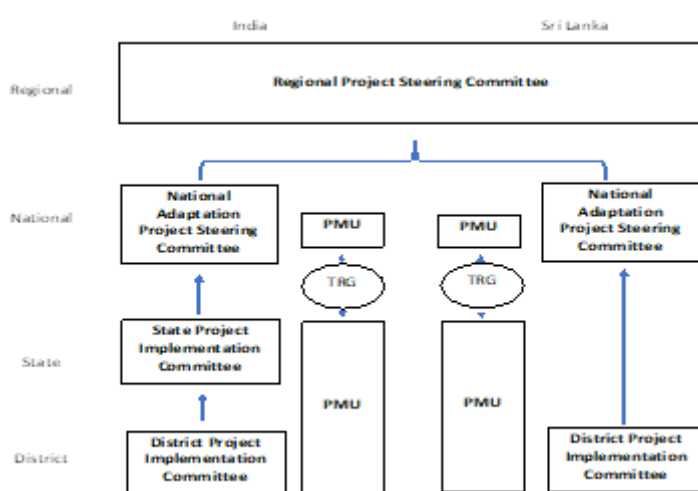
- a. **Recruitment:** Based on agreed ToRs with MoEFCC, hiring of staff will be undertaken by WFP. The working locations will be flexible given COVID protocols. The National Project Coordinator, Information Systems and Reporting Associate and Business Support/Finance Assistant will be based in the National Project Management Unit (NPMU), while other staff will operate from the WFP office. The state/district level PMU staff will be based in respective government offices with basic office facilities.
- b. **Procurement:** Procurement of equipment, materials, goods and services will be undertaken by WFP as per WFP's procurement rules. For hiring implementation agencies, research agencies and other services, the ToRs will be validated by relevant offices. Further details regarding this and other project activities will be elaborated through the MoU/LoA with each state.

In India, the costs and other details of project execution activities to be executed by the state governments, such as training, awareness activities, meetings and workshops, will be specified in the state MoUs/LoAs and will be aligned to the inception report shared and endorsed at national level upon approval of the project at inception phase.

Regarding project execution and facilitation, while implementation will be undertaken at state and district level, the MoEFCC as Executing Entity will facilitate this process through timely concurrence on the workplans, annual budget, job descriptions for hiring staff of the National Project Management Unit, the Terms of Reference for technical consultants, research and evaluation, and other relevant project implementation activities in consultation with WFP so that project milestones are reached effectively.

A simplified project organogram is provided in Figure 1. The detailed project organograms for Sri Lanka and for India, which indicate how the PMUs will interact with sub-national executing entities, among other details, are contained in **Annex 6**.

Figure 1 Project organogram



A National Project Management Unit (NPMU) will be established in each country in collaboration with the Executing Entity (EE) Ministry. The NPMU will be responsible for the overall execution of the project and will take the lead in executing project activities and facilitating coordination with various stakeholders at the national level. The PMU in each country will consist of a National Project Coordinator, Communications and Reporting Associate (Sri Lanka), Knowledge Management/Information Systems & Communication Associate (India), and a Business & Finance Support Assistant (one each in India and Sri Lanka). The WFP Gender and Protection Officer in the WFP Sri Lanka Country Office and the WFP Gender and Inclusion Officer in the WFP India Country Office will provide gender-related technical services on a cost sharing basis to the project. The Gender and Inclusion Officer (India) and the Gender and Protection Officer (Sri Lanka) will spend a considerable amount of time in the field ensuring integration of gender and inclusion measures into the project activities and monitoring for this.

The project staff will include a M&E and Information Systems Associate, shared between the two countries. The National Project Coordinators will have a representative role in regional and sub-national coordination committees specified below. In India and Sri Lanka, to mobilize implementation at the sub-national level, the PMU will include Sub-national Implementation Leads (4 in Sri Lanka), state/district Implementation Managers (3 in India, 6 in Sri Lanka) and Field Associates (3 in India) who will be recruited with a critical role in community engagement, mobilising convergence of technical agencies, organising project activities and facilitating data collection and monitoring. In Sri Lanka, the WFP Lead on Resilience, Emergency Preparedness and Response, and Social Protection; the Manager: Resilience building; the Agriculture Specialist; the Water Management Engineer; and a Value Chain Officer will provide technical assistance on a cost sharing basis on specific technical aspects of the project: agronomy, and agroforestry, irrigation and watershed management; and climate resilient livelihoods. In India, three technical officers will be recruited to provide technical assistance on specific technical aspects of the project: irrigation and watershed management; agronomy and agroforestry; and climate resilient livelihoods. These experts will provide support to field level operations to ensure optimal standards and quality of operations, as well as technical assistance to ensure sustainable capacities at institutional level.

Gender mainstreaming: WFP Gender and Protection/Inclusion Officers will provide the necessary support and technical backstopping to project staff and to implementing partners to ensure that gender, protection and accountability to beneficiaries are maintained throughout the project lifecycle. This will be facilitated most directly by the Gender and Protection (G&P) Officer in the WFP Sri Lanka Country Office and the Gender and Inclusion Officer in the WFP India Country Office. The WFP G&P teams at national level mainstream gender and protection across all WFP projects, supported by the Gender Advisor at the WFP Regional Bureau in Bangkok, and will thus coordinate gender mainstreaming for the AF regional project during planning, implementation, M&E and reporting; as well as into the complaints and feedback mechanisms.

The WFP G&P team will support gender mainstreaming in the project by (i) attending the project's inception and work planning meetings to ensure that the gender, inclusion and protection lens is applied in all project processes from the outset; (ii) providing mainstreaming support in annual/quarterly review meetings, operational plans, reviewing of annual/quarterly reports, and ensuring that annual workplans adopt a gender-responsive, and where possible, a gender-transformative approach; and (iii) assisting the project staff to facilitate gender, protection and inclusion workshops and training where necessary, with their operational costs being covered by existing WFP funds and cost-sharing with the project, which will cover 30 percent of this; workshop funds will be covered by the project budget.

To further strengthen gender mainstreaming, the recruitment process for certain PMU staff in each country – the National Project Coordinator, the M&E and Information Systems Associate, and the Knowledge Management and Communication Associate – will specify that they have experience in gender mainstreaming. The G&P/I Officers in each WFP Country Office will support the staff recruitment process to ensure the ToRs adequately reflect the required gender mainstreaming and inclusion roles.

A.2. Project governance structure

A Regional Project Steering Committee (RPSC) will be established with the participation of the Secretaries of the Executing Entities in each country, the WFP Country Directors, the WFP Regional Bureau Bangkok (RBB) Technical Advisor on Climate Change and DRR, and the National Project Coordinators from each of the PMUs. Representatives from technical agencies and regional platforms will be invited based on agreement between the two countries at the inception phase. The RPSC will provide coordination and oversight of project activities, engage in policy dialogues and knowledge exchange, facilitate south-south triangular cooperation, and develop advocacy and joint strategies for dissemination at global platforms. The committee will meet every six months in Year 1 and Year 5, and annually for the remaining project period.

Policy guidance and oversight to the project at the national level will be provided by a **National Adaptation Project Steering Committee (NAPSC)** co-chaired by the Secretary, MoE and WFP Representative in Sri

Lanka, and by the Secretary, MoEFCC and WFP Country Director in India. The membership of the NAPSC in Sri Lanka will consist of Additional Secretaries or Director Generals at the Ministries of Environment, Agriculture and Women's Affairs, and will include the Departments of National Planning, Irrigation, Meteorology and Agrarian Development. In India, the membership will include Additional Secretaries of Ministries of Agriculture and Farmer Welfare, Rural Development, Jalashakti, and the Indian Meteorological Department, as well as the Ministries of Women and Child Development, and Tribal Affairs. The NAPSC will convene every six months/annually to review project performance (physical and financial) based on approved annual workplans, facilitate resolutions of challenges and bottlenecks, and endorse terms of reference for M&E processes. This national committee will be an advisory body in each country and will ensure alignment with other related national committees on climate change. The final authority on the recommendations made by the NAPSCs in each country will lie with the EE and WFP, who will take decisions based on consensus.

A national **Technical Resource Group** (TRG) will be established in each country to provide guidance to the PMU on programme strategies and project materials to ensure alignment and quality standards. Both Sri Lanka and India have National Technical Working Groups comprised of leading experts on different climate change-related fields. These existing structures will be drawn on to form the project's TRG, based on the specific requirements of the project. The experts on the TRG may include specialists on nature resources management, gender, disaster risk reduction, climate-resilient infrastructure, climate-resilient value chains, drylands, climate change adaptation, hydrometeorology, and community-based participatory planning. The role of the TRG may include inputs into planning and design of strategies and tools, reviewing project materials, and sharing information and technologies on the latest developments in the field. The interactions between the TRG and the PMU will also ensure that project outcomes and learning are mainstreamed in the fields of practice of the TRG members.

At the subnational levels (State and/or districts), **Project Implementation Committees** (PICs) will enable the development of project workplans, coordinate the implementation of project activities, provide guidance and direction to the NPMU as requested, alert the NAPSC on any major challenges and risks affecting implementation progress, facilitate assessments and validate project information management dashboards under the direction of state/district leadership. In Sri Lanka the PICs will be guided by the District Secretary (Government Agent) and represented by key Departments involved in project implementation and assisted by the Sub-national Implementation Leads and District Implementation Managers. Four PICs will facilitate implementation on the ground with adequate convergence, co-ordination and synergies with key programmes and activities in the six districts, undertake necessary corrective actions for increased effectiveness and ensure planned fund utilization. In India, the district-level PICs will be guided by the District Collector and represented by key Departments involved in project implementation. These PICs will facilitate implementation on the ground with adequate convergence, co-ordination and synergies with key programmes and activities in the district, undertake necessary corrective actions for increased effectiveness and ensure planned fund utilization. These PICs will work in co-ordination with the existing state level climate committees.

The National Bank for Agriculture and Rural Development (NABARD), which is the National Implementing Entity (NIE) accredited by the AF in India, was consulted at the Concept Note development stage and potential involvement was discussed. The projects NABARD is supporting as NIE were mapped and discussed to avoid overlap and build synergies. In the proposed regional project, NABARD will be involved as a part of knowledge exchange and learning opportunities and will be included in specific meetings of the project's Technical Resources Group, based on the agenda for discussion, to maintain good channels of communication and harness any potential synergies that may arise, including for capacity development of NABARD.

B. Measures for financial and project risk management

Financial and project risk management measures will be assessed throughout the project design and implementation. Potential risks related to project implementation and response measures are described in **Table 7**.

Table 7. Financial and Project Risks and Response Measures

Risk	Ranking	Explanation and response Measure
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Political risk	Medium	To address the risk of political volatility and civil unrest that could interrupt the project occurring in either country, WFP will seek to reduce the effects by establishing strong operational partnerships with a range of national organizations, and by engaging in advocacy with and support of national partners. WFP will strive to establish a sentiment of full ownership amongst government stakeholders and will deepen its ongoing capacity strengthening role to support key executing partners to deploy adaptive management in the event of disruptive political risk.
COVID-19 pandemic	Medium	During the preceding waves of the ongoing Covid-19 pandemic, the Governments in both countries temporarily closed borders and restricted domestic movement to reduce the risk of transmission. In the event of additional severe waves of infections during project implementation, the Governments could adopt similar mitigation methods, causing delays in international procurement and travel of staff / consultants both internationally and domestically for project implementation. This risk will be mitigated by ensuring that appropriate local partnerships are managed for efficient implementation, and employing e-working when possible, with international staff or consultants. WFP's existing procurement practices will ensure materials and equipment are successfully and safely brought into the country. Although the COVID-19 situation is significantly improved since the first two years of the pandemic, any potential restrictions on movement and gatherings within each of the countries could have an impact on the critical awareness raising activities and could also affect government capacity to follow up on implementation. The decentralised mechanisms for implementation specified in Part III.A will reduce any disruptions to implementation, should there be restrictions on domestic movement.
Financial management	Medium to low	<p>Delays in the release of funds and unexpected challenges in financial management structures and processes in the two countries can result in the late start of the project as well as delays during the implementation period and other inefficiencies. To mitigate this, strict procedures will be followed for financial management and procurement, in line with the statutory procedures of both Governments. Any procurement under the project will be conducted under rules equivalent to WFP's procurement procedures. To reduce the burden on government procurement structures, the GoI has requested WFP to provide project services of procurement, with the exception of minor expenditures such as office supplies. WFP uses international standards and prescribed procedures and checks to reduce mismanagement of funds. In Sri Lanka, WFP will assist the GoSL with the facilitation of procurement processes under rules equivalent to WFP's own procurement rules. Mandatory checks and quality assurances will also ensure implementation quality is maintained. WFP's longstanding logistics and supply chain mechanism will ensure on-time delivery of necessary project inputs and equipment.</p> <p>At the community level, project activities will result in increased financial literacy as well as increased access to funds that can be used by vulnerable communities to implement their selected adaptation options and climate resilient livelihood strategies. Thus, it can be expected that the project will improve household-level financial management, as well as that of farmers' groups or other small groups involved in adaptation activities, thereby reducing risks related to household – and group- level financial management.</p>

Implementation Risks	Medium	<p>A range of implementation risks could lead to not meeting the timeline of activities and could jeopardise the effectiveness and sustainability of the project activities. Insufficient supply of and quality of climate-resilient varieties – such as quality seeds and multi-purpose trees for agroforestry – is a risk that will be addressed through strong involvement of the relevant national agricultural research institutes and the seed secretariat that have been developing climate-resilient and nutrition-dense seeds and varieties for diversifying away from rice, as well as propagating climate resilient saplings. The project will support outscaling of the research institutes’ activities, and thus strengthen the government and research systems for provision of greater quantities of high-quality climate-resilient varieties. The project will make use of the nurseries developed under the other interventions for suitable multi-purpose trees for agroforestry. By building the capabilities of the extension officers and other district-level service providers, the project will support the development of experienced officials at district and even village level to implement the activities in a timely and effective manner.</p> <p>An implementation risk that has hampered previous projects has been the lack of credible data, with many actions to address climate change being based largely on assumptions. By introducing and disseminating localized LMCS based on improved forecasting that is targeted to different livelihoods and localities, and by leveraging targeted technical assistance and capacity strengthening, the project will be able to significantly reduce this risk; by institutionalizing the multi-level systems for LMCS within each of the countries, the project will help to reduce the risks for interventions in other localities and in the future.</p>
Economic crisis (in Sri Lanka)	Medium to High	<p>Sri Lanka is experiencing a rapidly deteriorating economic crisis exacerbated by policy decisions that have drastically driven a reduction in agricultural production and yield, a sharp decrease in foreign exchange reserves, and a steep rise in inflation and food prices. The GoSL has requested the support of the UN for multi-sector international assistance to respond to the most urgent needs arising from the crisis, resulting in a Humanitarian Needs and Priorities (HNP) Plan calling for USD 47.2 million to provide life-saving assistance to 1.7 million people or 30 percent of the impacted population over a four-month period from June to September 2022.²¹⁷ While this will reduce some of the immediate impacts of the economic and food crisis, development partners have emphasized the importance of protecting development gains and ensuring climate financing catalyses a green economic recovery, including through this proposed Regional AF project. Recognizing the challenges in the operating context, the project has integrated mitigation measures on inflation, including that any international procurement be conducted by WFP and has developed relatively conservative targets for activities in Sri Lanka that could be affected by inflation.</p> <p>To mitigate the risk of limited capacity of the executing agency as a result of the economic crisis in Sri Lanka, the GoSL has requested WFP to facilitate critical activities such as recruitment and procurement. Sufficient staff have been included in the PMU at both national and district level and staff of the WFP Country Office will provide dedicated support to mitigate this risk.</p>

²¹⁷ UN OCHA (2022) Humanitarian Needs and Priorities (HNP) Plan for the period June – September 2022, issued on 09 June 2022. https://srilanka.un.org/sites/default/files/2022-06/LKA_HNP_FoodSecurityCrisis_20220609_0.pdf last accessed 29/07/22.

Natural hazards / environmental risk	Medium	<p>There is a risk that increased occurrence of extreme weather events will impact end users before sustainable mechanisms for mitigation are developed by the project. The project has been designed to reduce from the first full year of operations the climate-related risks to smallholder farmers that accrue through increased temperatures, more erratic rainfall, and more frequent droughts and localised flooding, through the development and dissemination of targeted LMCS that will inform community level adaptation planning, as well as by identifying activities in the menu of adaptation options that reduce the risks from extreme weather and increase resilience such as restoration of catchments above the minor irrigation reservoirs that will be restored, agroforestry, tree planting, vegetated contour ridges and swales, and other SLM actions, as well as implementation of household level adaptation responses that reduce the impacts of extreme weather. Moreover, the facilitation of increased access to finance for community members is expected to increase the adoption of risk reduction measures by households, groups and communities. The project will also make use of the services from the various committees in each country that comprise technical resource teams.</p>
Lack of maintenance of community-level assets developed	Medium to low	<p>Community participation is key for the sustainability of interventions. The project will engender community willingness to participate by providing incentives in the form of benefits such as support and technology packages to adaptation assets at the household, group and community level. For all assets at the farmers' groups and community levels, specific agreements will be discussed during the participatory adaptation planning process, and developed prior to implementation, which will spell out (i) ownership arrangements; ii) management arrangements; and iii) maintenance arrangements, in the interests of sustainability. The latter will thus include considerations of availability of maintenance in the area and accessibility in terms of costs. The agreements will be concluded to ensure equal participation and benefit of women, youth, and vulnerable groups. Where agroforestry is implemented or trees are planted under group- or community-management, formal agreements will be discussed during community adaptation planning and developed prior to implementation, that specify clear responsibilities for maintenance, so that trees are able to survive the first couple of years and beyond. Under Component 2, during selection of concrete adaptation options, the project will promote gender equality through equal participation of different socio-economic groups such as women and youth (female and male) and their institutions (including local leaders and technical staff from government and partner organisations), to produce community adaptation plans that are relevant to their specific needs and context; this is a further risk reduction factor. The project has allocated sufficient funds to monitor project progress and impacts, towards ensuring the sustainability of project activities. The risk of lack of maintenance of community assets is rated as low in India due to the alignment with existing national schemes which have been designed and implemented for some time to factor in sustainability with respect to community-level assets.</p>

C. Environmental and social risk management

The entire project was screened for environmental and social risks against the 15 principles outlined in the AF's Environmental and Social Policy, as set out in Part III.K above. The project proposal is classified as a "Category B" or "medium risk" project, mainly due to the presence of Undefined Sub-Projects in Component 2 of the project. The full E&S Screening and assessment is included in **Annex 2**.

The Environmental and Social Management Plan (ESMP) is described in **Annex 2** and is articulated at two levels:

1. Risk mitigation measures (and monitoring and reporting thereof) for the risks identified through the risk screening and assessment of the proposal;
2. Procedures for the screening, assessment and mitigation of the Undefined Sub-Projects (in Component 2) during the implementation of the project. **Annex 2** lists potential and excluded sub-projects.

The ESMP elaborated for this project will consider and track risks that have been identified at proposal stage; screen for any new risks during the implementation of the project and serve to monitor and report on the mitigation measures. The monitoring and reporting measures proposed in the ESMP are fully integrated in the monitoring plan of the project.

The ESMP does not allow the implementation of activities, including undefined sub-projects, with high risk. The proposed project will fully comply with national laws particularly the National Environmental Regulations, the Adaptation Fund's Environmental and Social Policy and the WFP's social and environmental standards. During implementation the WFP and its partners will ensure effective coordination with the National Environmental Agencies in order to duly comply with the requirements established within the National Environmental Regulation and Guidelines. In this regard, a screening form will have to be obtained from NEAs for each Field-Level Agreement (sub-project) and submitted to them for review before implementation starts.

The beneficiaries and affected populations have access to a Grievance Mechanism which is described in **Annex 3**. Complaints and feedback can be filed through different channels, in order to make it as inclusive as possible.

D. Monitoring and evaluation arrangements

Gender-responsive project monitoring, reporting and evaluation will be conducted in line with the WFP guidelines, procedures and standards and in adherence with WFP's internal "Evaluation Quality Assurance System" (EQAS). The EQAS approach promotes a systematic approach to internal and external stakeholder involvement, thereby ensuring balanced and accurate findings that support relevant recommendations for optimal use in evidence-based decision-making. WFP will ensure that project financial monitoring and accounting follow the International Public Sector Accounting Standards (IPSAS), and also accord with and adhere to national regulations and guidelines.

The overall responsibility for project monitoring, evaluation and reporting will rest with WFP. The WFP Heads of Research, Monitoring and Assessments in each CO will provide guidance to the National Project Coordinators and to the M&E Officers located within the country-level PMUs and ensure that monitoring and evaluation (M&E) processes, outcomes, outputs and activities are aligned with the AF Strategic Results Framework and with AF rules and regulations.

The following will be the key project monitoring and evaluation and reporting activities:

Inception planning: The project will begin with an inception period of three to six months. Inception activities will include developing and signing agreements with the relevant stakeholders and partners, recruitment and induction of staff and procurement of project equipment and material. The inception period will also involve: (i) planning and stakeholder engagement for setting up / activating the relevant coordination mechanisms/structures including the RPSC, NAPSCs, TRGs, and sub-national PICs; (ii) setting up of project accounts; and (iii) holding an inception workshop. The inception workshop will be held to provisionally identify the targeted localities within the identified districts; develop the first year workplan and detailed budget, and further refine implementation approaches, including targeting approaches; and develop systems/tools including for M&E, community engagement, tailoring the complaints and feedback mechanism, and approving standard operating procedures (SOPs) to clarify roles of the stakeholders and partners that will be developed before the inception workshop. All planning, monitoring and reporting templates shall be validated during the inception workshop and endorsed by the project steering committees.

Baselines Assessments, feasibility/technical studies: The project baseline assessments will be conducted within the first months of the project to establish necessary baseline values for measuring indicators set out in the results framework. The planning for the baseline assessments will be done as part of the inception process.

Quarterly and annual reviews and progress reports: Regular monitoring during project execution will be reported through quarterly progress reports and annual progress reports. The NPCs within the PMUs will facilitate preparation of quarterly progress reports to be submitted to WFP and the PSCs. A strong management information system (MIS) with constantly updated dashboards and almost real-time monitoring

of key indicators will be developed as a part of project. This information will feed into the periodic reporting and support evidence-based decision making throughout the project.

Annual Progress Reports: The National Project Coordinators, with technical support from the WFP Heads of Programme, will coordinate inputs from the implementation sectors and partners to prepare Annual Progress Reports for submission to WFP and the PSCs. The reports will outline financial, procurement and activity implementation progress against the targets in the results framework as well as compliance with the requirements of the environmental and social assessment and management frameworks.

The annual reports and workplans will be reviewed and approved by the NAPSCs before being submitted to WFP and the RPSC no later than one month after the end of the project year. WFP will then consolidate and submit the Annual Progress Reports in the standard AF PPR template to the AF Secretariat no later than two months after the end of the project implementation year.

The national PMUs will ensure that the PPRs are supplemented by annual project work plans for the next Project year, also to be approved by the PSCs. The annual plan for the forthcoming year will include details on specific project activities, roles and responsibilities, and a detailed budget with a disbursement schedule and procurement plan for major items included as annexes.

At the end of the project, a project completion report shall be prepared within six months after project completion and submitted by WFP to the AF secretariat.

Mid-term review and final evaluation: An external independent mid-term review will be carried out half-way through project implementation and will provide an overview of the state of project implementation, effectiveness of implementation arrangements, and recommendations for project modifications if any. An independent final evaluation will be completed within nine months after project termination.

Finally, a financial audit will be provided by WFP to the AF Secretariat six months after the end of the fiscal year in which the project ended.

An indicative plan and costing for monitoring, reporting and evaluation activities is provided below. Final copies of the review and evaluation reports will be shared with the MoE and MoEFCC for their records. **Table 8** outlines an indicative schedule for monitoring and evaluation and reporting, and responsibilities between MoE, MoEFCC, and WFP.

Table 8. Indicative Project Monitoring and Evaluation and Reporting Schedule

Type of Report	Responsible parties	Budget (USD)	Timeframe and submission deadline
Inception Report	National Project Coordinators	15,000	1 month after inception workshop
Baseline Study Report	National Project Coordinators WFP Heads of Research, Monitoring and Assessments	80,000	1 month after completion of the data collection
Monthly dashboard report	National Project Coordinators	0	Monthly (Last day of month)
Quarterly Progress and Financial Report	National Project Coordinators	0	End of each quarter (1 month after end of quarter)
Regional and National Project Adaptation Steering Committee Meetings (minutes, presentations & action plans)	National Project Coordinators	0	RPSC every six months in Year 1 & Year 5, annually in other years; NAPSC every six months/annually
Annual Progress Reports (Project Performance Report-PPRs)	National Project Coordinators WFP Heads of Climate Resilience	0	Annually, 2 months after the end of the project implementation year)
Mid-Term Review Report	External Consultants WFP Heads of Research, Monitoring and Assessments	40,000	2.5 years after project inception (3 months after data collection)

Final Project Report (Project Completion Report)	National Project Coordinators WFP Heads of Climate Resilience	0	End of project (6 months after end of project)
Endline and Final Project Evaluation and Report	External Consultants WFP Heads of Research, Monitoring and Assessments	135,422	End of project (within 9 months of project completion)
Financial Audit	WFP Auditing company	30,000	End of project (within 6 months after the end of the fiscal year in which the project ended)
Total		300,422	

E. Project results framework

In addition to the specific indicators set out in this results framework, the project will contribute to the achievements of the NDCs of both countries, as well as to the SDGs of India and Sri Lanka, as specified in Part II.E. In the table, TBD = to be determined; TBC = to be confirmed.

Project impact	Indicator	Baseline	Target	Source of Verification	Risks and Assumptions
Increased climate change adaptive capacity and food security of vulnerable communities in Sri Lanka's dry zone and India's eastern coastal states	I.1. Number of beneficiaries	Direct: 0 Indirect: 0	Direct: 704,455 Indirect: 942,768 (TBC during Inception Phase)	Project reports Project reports	<ul style="list-style-type: none"> Ongoing COVID-19 pandemic could delay implementation and reduce effectiveness of project activities, thus potentially reducing impact. (R) The political stability and support from both countries will continue during project implementation. (A)
	I.2. Assets produced, developed, improved, or strengthened	Community level: 0 Individual level: 0	40 minor irrigation reservoirs, TBC at inception TBD during participatory CAP planning process	Project reports Project reports	
	I.3. Livelihood-based Coping Strategy Index (CSI) ²¹⁸	TBD. Percentage of households not recurring to any negative livelihood coping strategy	At least 40% increase in the number of targeted households not recurring to any livelihood coping strategy	Baseline Survey and Endline Survey	
	I.4. Percentage of HHs in targeted communities with borderline and acceptable Food Consumption Score (FCS) ²¹⁹	TBD (Baseline FCS borderline and acceptable = xx%)	Borderline and acceptable FCS (XX%) increased by 20%	Baseline Survey and Endline Survey	
	I.5. Climate Adaptation Benefit Score ²²⁰	TBD, Percentage of households with increased	At least 50% increase in the number of targeted households moving from low to		

²¹⁸ Coping Strategy Index (CSI) is a proxy indicator of household food insecurity. CSI is based on a list of behaviors (coping strategies). CSI combines: (i) the *frequency* of each strategy and (ii) their *severity* for households reporting food consumption problems. Higher CSI indicates a worse food security situation and vice versa.

²¹⁹ The FCS is considered as a proxy indicator of current food security. FCS is a composite score based on dietary frequency, food frequency and relative nutrition importance of different food groups.

²²⁰ The CABS indicator measures households' perception of the extent they benefited from trainings, information or advice received to improve their resilience to climate hazards, stresses, and variability by adapting agricultural practices and livelihoods.

		climate adaptative capacity	medium and high category		
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Component 1: Enhanced effectiveness of last mile climate services to enable vulnerable communities to manage and adapt to climate variability and change					
Outcome/Output	Indicator	Baseline	Target	Source of Verification	Risks and Assumptions
Outcome 1.1 Strengthened capacities to ensure access to last mile climate services for vulnerable communities	1.1.a Improved awareness of and access to localized, timely and targeted climate services ²²¹ by vulnerable groups	TBD	At least 70% of HHs (disaggregated) in targeted villages have improved awareness of and access to LMCS	Baseline & Endline Survey	<ul style="list-style-type: none"> No major shocks and related emergency responses jeopardize the implementation of sensitization and training activities (A) Climate services can be tailored to the needs of the communities and targeted communities use these – assumes the necessary localized data is available or can be developed (A)
	1.1.b Climate services score ²²²	TBD	TBD at inception; project will aim for at least 50% of HHs in targeted villages using LMCS	Baseline & Endline Survey	
Output 1.1.1. National and sub-national level meteorological and agricultural agencies and other stakeholders trained and equipped to co-produce tailored climate services for vulnerable groups	1.1.1.a. Number of stakeholders (government, and others) trained on developing LMCS, disaggregated by gender and age	0	400	Workshop / training reports	<ul style="list-style-type: none"> No major shocks jeopardize the implementation of trainings (A)
	1.1.1.b. No. of multi-level institutional mechanisms developed/strengthened to share knowledge for co-production	0	TBD	Study reports Assessment reports	
Output 1.1.2. Strategy and feedback loop for the	1.1.2.a. Number of strategies and feed-back	0	4 (1 in Sri Lanka; 1 for each Indian state)	Project/ Workshop reports	<ul style="list-style-type: none">

²²¹ **Localized:** customised climate services to address agriculture and livelihood practices that change from area to area; **Timely:** Smallholder farmers need access to reliable forecast information along with location-specific agricultural advisories at a shorter lead time than the seasonal forecast – for example, one to two weeks in advance, which would allow them to make risk-averse decisions on managing the homestead, their crops and livestock – such as planting drought- or flood-resistant varieties, making arrangements for fodder, vaccination, etc.; **Targeted:** climate and weather information tailored to smallholder farmers’ needs. Special attention will be paid to the needs of women and vulnerable groups, to ensure equitable access to critical information on weather alerts, cropping patterns, and other agro-met advice.

²²² This WFP Corporate Results Framework outcome indicator measures the extent to which communities are able to manage climatic shocks and risks through information and practices, including LMCS.

sustainable co-development and dissemination of tailored last mile climate services validated through community engagement	system developed for bottom-up co-development and dissemination of LMCS				
Output 1.1.3 Awareness raising sessions and technical training conducted for local government, service providers and local communities to access, understand and use climate information	1.1.3.a Number of dissemination champions trained on effective communication of tailored climate and weather advisories	0	At least 50 women and 50 youth per country (30 female, 20 male)	Project/ Workshop reports	<ul style="list-style-type: none"> Sub-national structures are committed to strengthening their capacities and receive political support to do this (A)
	1.1.3.b Number of community awareness raising and outreach sessions conducted	0	1 per district each year	Project reports	
	1.1.3.c Number of technical trainings on co-production of LMCS conducted with local government, service providers and local communities	0	1 per district each year	Project reports	
Output 1.1.4 Last mile climate services disseminated through identified, tailored and continuous communication channels, with feedback mechanism to ensure effectiveness	1.1.4.a Number of people provided with direct access to information on climate and weather risks	0	TBD at inception	Field monitoring	
Outcome 1.2 Strengthened multi-level systems and regional knowledge sharing to develop and scale up tailored last mile climate services	1.2.a Key stakeholders engage collaboratively with the national multi-level systems for LMCS and report effective use of it	TBD	TBD	Baseline survey and national stakeholders' interviews	<ul style="list-style-type: none"> No major shocks and related emergency responses jeopardize the implementation of sensitization activities (A) Covid-19 pandemic could delay implementation and reduce effectiveness of project activities, thus
	1.2.b Regional stakeholders receive and use knowledge shared	TBD	TBD	Baseline survey and regional	

				stakeholders' interviews	potentially reducing impact. (R)
Output 1.2.1 Advocacy sessions and technical assistance provided to institutionalize co-production of last mile climate services in Sri Lanka and India	1.2.1.a. Number of advocacy tools developed and events held for institutionalizing and scaling up LMCS in two countries	0	2 tools and 6 events	Project reports	<ul style="list-style-type: none"> • Covid-19 could prevent sufficiently participatory activities necessary for LCCAP planning and systematic approach to climate change capacity development. (R)
Output 1.2.2 Regional knowledge sharing platforms leveraged for vertical and horizontal knowledge exchange and scaling out of tailored last mile climate services	1.2.2.a Number of regional knowledge sharing and exchange platforms leveraged / strengthened	0	2	Project reports	<ul style="list-style-type: none"> •
	1.2.2.b Number of regional knowledge sharing events on LMCS held for bottom-up sharing and exchange of best practices	0	3	Project reports	
Component 2: Community-based adaptation and diversified livelihoods enabled					
Outcome/Output	Indicator	Baseline	Target	Source of Verification	Risks and Assumptions
Outcome 2.1 Strengthened community-level capacities to develop and sustain adaptation plans	2.1.a. Percentage of targeted HHs reporting ongoing benefits from enhanced livelihood asset base, by age and gender	0	50% of beneficiary HHs, by age and gender	Project Mid-term review and End-line Survey	<ul style="list-style-type: none"> • Extreme weather conditions and severe recurrent drought during the project implementation might limit adaptive capacities (R). • Communities prioritize the diversification and strengthening of their livelihood bases in their adaptation plan (A).
	2.1.b. Proportion of the population in targeted communities reporting environmental benefits ²²³	0	At least 70% of beneficiary HHs, by age and gender	Project Mid-term review and End-line Survey	
2.1.1 Community adaptation plans developed through participatory approaches to identify short- to long-term adaptation strategies	2.1.1.a Number of community adaptation plans (CAPs) enhanced/developed	0	One per targeted village 942,768	List of community adaptation plans Project reports	<ul style="list-style-type: none"> • Community members are sufficiently interested in and willing to take part in CAP process (A)

²²³ Both of these indicators (2.1.a and 2.1.b) are in the new WFP Corporate Results Framework

	2.1.1.b Number of people benefiting from the development of community adaptation plans, disaggregated by age and gender				<ul style="list-style-type: none"> • Exclusion of community from the planning process (R) • Policy changes related to schemes may adversely or positively impact the project.
Output 2.1.2 Linkages facilitated between community members and financial services and existing schemes for long-term sustainability of adaptation plans	<p>2.1.2.a Percentage of households in targeted communities with access to savings products and micro finance, by gender and age²²⁴</p> <p>2.1.2.b Number of linkages facilitated and finance mobilized for CAPs</p>	TBD 0	50% increase on baseline TBD at inception	Baseline & Endline Survey Baseline & Endline Survey	<ul style="list-style-type: none"> •
Outcome 2.2 Increased benefits to community members through implementing adaptation plans and diversifying livelihoods	<p>2.2.a Climate resilience capacity score</p> <p>2.2.b Number of HHs benefiting from increased income from adapting their farming practices due to LMCS, by age and gender of HH head</p>	TBD 0	TBD 33,527 HHs	Baseline & Endline Survey	<ul style="list-style-type: none"> •
Output 2.2.1 Communities and households provided with technical assistance and resources to implement adaptation measures	<p>2.2.1.a. No. and type of adaptation assets created or strengthened in support of individual livelihood strategies</p> <p>2.2.1.b. Number of community level assets created / restored</p>	0 0	TBD during participatory CAP planning process 40 minor irrigation reservoirs, TBC at inception	Project reports Project reports	<ul style="list-style-type: none"> • Communities and households may consider asset creation activities as social safety net programme and not take much interest in its continuity beyond the project (R)
Output 2.2.2 Farmers trained and equipped to develop and implement diversified on-farm and off-farm livelihood options	2.2.2.a. Number of climate resilient value chain analyses conducted	0	4 (TBC)	Value Chain Study reports	<ul style="list-style-type: none"> • Recovery from economic crisis is fast and markets are conducive to project activities in Sri Lanka (A)

²²⁴ This may be determined using the new WFP CRF Potential Investment Capacity indicator

F. Project alignment with the Adaptation Fund Results Framework

Project Objective(s) ²²⁵	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Component 1: Enhanced effectiveness of last mile climate services to enable vulnerable communities to manage and adapt to climate variability and change	1.1.a. Improved awareness of and access to localized, timely and targeted climate services by vulnerable groups ²²⁶	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	3.1. Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	3,160,244
Component 2: Community-based adaptation and diversified livelihoods enabled	2.1.a. Percentage of targeted HHs reporting ongoing benefits from enhanced livelihood asset base, by age and gender	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.2. Percentage of targeted population with sustained climate-resilient alternative livelihoods	8,548,411
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator	Grant Amount (USD)
Outcome 1.1 Strengthened capacities to ensure access to last mile climate services for vulnerable communities	1.1.1.b. No. of multi-level institutional mechanisms developed/strengthened to share knowledge for co-production	Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.1 No. of technical committees/associations formed to ensure transfer of knowledge	2,416,373
Outcome 1.2 Strengthened multi-level systems and regional knowledge sharing to develop and scale up tailored last mile climate services	1.2.1.a. Number of advocacy tools developed and events held for institutionalizing and scaling up LMCS in two countries	Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2.2 No. of tools and guidelines developed (thematic, sectoral, institutional) and shared with relevant stakeholders	743,871
Outcome 2.1 Strengthened community-level capacities to	2.1.2.a. Percentage of households in targeted communities with access to savings	Output 6: Targeted individual and community livelihood strategies	6.2.1. Type of income sources for households generated under	1,578,107

²²⁵ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

²²⁶ The target for this indicator is for at least 70% of HHs (disaggregated according to gender and age of HH head) in targeted villages have improved awareness of and access to LMCS, which is in alignment with the AF's outcome indicator 3.1.

develop and sustain adaptation plans	products and micro finance, by gender and age ²²⁷	strengthened in relation to climate change impacts, including variability	climate change scenario	
Outcome 2.2 Increased benefits to community members through implementing adaptation plans and diversifying livelihoods	2.2.1.a. No. and type of adaptation assets created or strengthened in support of individual livelihood strategies	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1. No. and type of adaptation assets (tangible and intangible) created or strengthened in support of individual or community livelihood strategies	6,970,304

²²⁷ This may be determined using the new WFP CRF Potential Investment Capacity indicator

F. Detailed budget²²⁸.

Activity No	Cost Classification	Annual Budget					Total Budget	Notes
		Y1	Y2	Y3	Y4	Y5		
1.1.1.1	Project Staff ²²⁹	2,000	3,000	3,500	5,000	1,500	15,000	Staff costs of national, state and sub-national Implementation leads, coordinators, implementation managers and experts for the initial formulation and ongoing coordination of the working group.
	Technical Assistance/FLA	4,760	6,200	6,200	6,200	4,640	28,000	Technical resource experts meet twice a year for workshops using WFP SOP; travel expenses are covered by resource fees.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	-	-	-	-	
	Workshop and Training	4,050	1,200	4,050	1,200	1,200	11,700	Venue, food costs for workshops and training - one in each state
	Travel	-	-	-	-	-	-	
	Miscellaneous	1,720	220	1,720	220	220	4,100	Costs associated with stationery, recordings, and communications.
		12,530	10,620	15,470	12,620	7,560	58,800	
1.1.1.2	Project Staff	3,835	2,835	1,335	2,335	1,335	11,675	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	22,846	22,846	-	-	-	45,692	Technical experts from meteorological services and agricultural universities are developing manuals and guidelines.
	Technical Assistance/FLA	-	-	-	-	-	-	
	Procurement	40,500	67,500	13,500	6,750	6,750	135,000	Implementing Participatory Integrated Climate Services to improve LMCS and LTA per the project's objectives. The procurement will occur during Year 1 expenditures that will be dispersed throughout the project duration.
	Workshop and Training	8,580	16,700	6,080	2,520	1,520	35,400	TOT with government and stakeholder participation in Year 1; government and stakeholder participation per district in Year 2; and refresher training in Year 3 to cover at least four seasons.
	Travel	4,534	9,713	-	200	-	14,447	National TOT in Year 1; two district trainings in Years 2 and 4 prior to the planting seasons

²²⁸ The cost sharing between the two countries is on 50:50 basis.

²²⁹ For all project staff cost, a detail description of the composition of the project team is included in section II A.1

	Miscellaneous	800	800	800	800	800	4,000	Costs associated with stationery, recordings, and communications.
		81,095	120,394	21,715	12,605	10,405	246,214	
1.1.1.3	Project Staff	7,146	2,146	2,146	2,146	2,146	15,730	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts allocated for technical consultations.
	Technical Assistance/FLA	16,169	9,615	1,923	1,923	-	29,630	Gap assessment, location identification involving technical experts, designing the tailored solutions after reviewing the needs
	Transfer	-	-	-	-	-	-	
	Procurement	48,048	121,096	23,048	11,524	11,524	215,240	Installation of automatic weather stations, rainfall measuring gauges, and other equipment identified in the gap assessment in Sri Lanka, and implementation of an IoT-based solution that generates data for at least eight to ten climate parameters at the village level to improve vulnerable communities' access to climate advisory information.
	Workshop and Training	2,308	5,769	1,154	1,154	1,154	11,539	Intensive training provided to 1,500 HH with engagement.
	Travel	-	-	-	-	-	-	
	Miscellaneous	800	2,000	1,200	-	-	4,000	Costs associated with stationery, recordings, and communications.
			74,471	140,626	29,471	16,747	14,824	276,139
1.1.1.4	Project Staff	3,000	3,000	3,000	3,000	3,000	15,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	7,600	13,000	9,400	4,000	4,000	38,000	Engagement of agriculture universities in service co-production.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	-	-	-	-	
	Workshop and Training	2,000	2,000	2,000	2,000	2,000	10,000	Participating in workshops and trainings for institutionalization.
	Travel	-	4,034	4,034	4,034	1,345	13,447	Climate services are delivered via extensive travel by NPMU/SMPU and others.
	Miscellaneous	200	200	200	200	200	1,000	Communication and stationery materials.
		12,800	22,234	18,634	13,234	10,545	77,447	

1.1.1.5	Project Staff	8,135	3,101	5,067	1,034	3,000	20,337	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts supporting resilience, agriculture, and livelihoods.
	Technical Assistance/FLA	14,602	9,735	-	-	-	24,337	Developing the strategy internally with assistance from the PMU/WFP and the technical resource group.
	Transfer	-	-	-	-	-	-	
	Procurement	10,260	8,550	3,420	-	3,420	25,650	Designing and publishing project briefs.
	Workshop and Training	-	-	-	-	-	-	
	Travel	2,689	5,379	4,034	1,345	-	13,447	Travel of technical experts/TRG members and stakeholders to provide input on the strategy for knowledge exchange and learning.
	Miscellaneous	800	800	800	800	800	4,000	Stationery, printing, and communication materials.
		36,486	27,565	13,321	3,179	7,220	87,771	
Total Output 1.1.1		217,382	321,439	98,611	58,385	50,554	746,371	
1.1.2.1	Project Staff	14,800	6,400	4,800	-	-	26,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	6,996	11,658	-	-	-	18,654	Resource expert involved in LMCS input into lessons learned document, Technical Expert /TRG to provide lessons from various initiatives across India to undertake assessment and inform the approach including the feedback loop and its sustainability
	Transfer	-	-	-	-	-	-	
	Procurement	30,000	-	-	-	-	30,000	1 strategy developed by a contracted technical agency with the assistance of a national subject matter expert and project management unit (PMU) with WFP staff.
	Workshop and Training	-	-	-	-	-	-	
	Travel	2,379	5,550	-	-	-	7,929	Cost of travel for staff, experts and personal
	Miscellaneous	600	1,400	-	-	-	2,000	Documentation printing and photography expenses
		54,775	25,008	4,800	-	-	84,583	
1.1.2.2	Project Staff	1,935	3,935	3,935	2,935	1,935	14,675	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts

	Technical Assistance/FLA	-	9,625	6,875	6,875	4,125	27,500	Contracting with a partner responsible for the feedback loop.
	Transfer	-	-	-	-	-	-	
	Procurement	7,000	21,000	3,500	1,750	1,750	35,000	Developing a system for feedback through multiple digital and physical channels, and refining recommendations and action.
	Workshop and Training	15,000	15,000	-	-	-	30,000	Two sessions for district-level inputs and validation with TRG/TAC The staff travels.
	Travel	5,255	3,076	300	200	100	8,931	Cost of travel for staff, experts and personal
	Miscellaneous	200	600	100	50	50	1,000	Internet costs for the first month and a screen-based presentation.
		29,390	53,236	14,710	11,810	7,960	117,106	
1.1.2.3	Project Staff	6,346	8,346	2,346	2,346	2,346	21,730	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	2,400	12,600	2,000	2,000	2,000	21,000	For bottom-up co-development, a resource expert or agency is involved in formulation and validation, as well as community engagement through an implementing partner. and propagation of LMCS.
	Transfer	-	-	-	-	-	-	
	Procurement	6,000	6,000	-	-	-	12,000	Developing digital and other functional mechanisms.
	Workshop and Training	1,600	2,400	-	-	-	4,000	Districts host sessions for community validation.
	Travel	2,193	5,979	5,379	3,586	1,793	18,930	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		18,539	35,325	9,725	7,932	6,139	77,660	
Total Output 1.1.2		102,704	113,569	29,235	19,742	14,099	279,349	
1.1.3.1	Project Staff	5,600	11,600	2,400	1,200	1,200	22,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	5,800	15,200	-	-	-	21,000	Tech resource, government, and IA develop a training and awareness strategy.
	Transfer	-	-	-	-	-	-	

	Procurement	3,600	8,400	-	-	-	12,000	Development of print, video, and audio materials for raising awareness Strategy validation and testing workshops.
	Workshop and Training	300	1,200	-	-	-	1,500	Workshops for validation/testing the strategy
	Travel	3,000	7,000	-	-	-	10,000	Cost of travel for staff, experts and personal to local communities to solicit feedback.
	Miscellaneous	400	400	400	400	400	2,000	Communication and stationery materials.
		18,700	43,800	2,800	1,600	1,600	68,500	
1.1.3.2	Project Staff	1,535	3,535	4,535	1,535	1,535	12,675	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	2,800	4,200	4,200	2,800	-	14,000	Expert guidance on effective communications, SOPs, guidelines developed.
	Transfer	-	-	-	-	-	-	
	Procurement	-	33,467	50,201	-	-	83,668	Train extension workers, traditional communicators, and women and youth change agents; ensure that at least 25 women and 25 youth serve as champions of dissemination.
	Workshop and Training	13,638	18,185	13,638	-	-	45,461	In addition to extension workers, 5 Climate Champions per village are trained for intensive engagement and effective communication, capitalizing on village functionaries of various government schemes (Implementing agencies/Cooperating partners).
	Travel	3,051	4,068	3,051	-	-	10,170	The staff travels.
	Miscellaneous	600	800	600	-	-	2,000	The printing of SOPs and regulations.
		21,624	64,255	76,225	4,335	1,535	167,974	
1.1.3.3	Project Staff	3,446	4,446	4,446	3,946	3,446	19,730	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	10,000	12,000	12,000	11,000	10,000	55,000	Participation of subject matter experts in quarterly community awareness sessions facilitates the use of community radio.
	Transfer	-	-	-	-	-	-	
	Procurement	32,500	97,500	97,500	65,000	32,500	325,000	In collaboration with technical subject matter experts, using participatory integrated climate services for agriculture (PICSA or a similar approach). Goal to reach 375 000 (Tier 2 beneficiaries) At the municipal level.

	Workshop and Training	900	2,700	2,700	1,800	900	9,000	At the district level.
	Travel	2,134	2,334	2,334	2,234	2,134	11,170	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		48,980	118,980	118,980	83,980	48,980	419,900	
1.1.3.4	Project Staff	5,546	5,546	5,546	3,546	2,546	22,730	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	4,300	4,300	4,300	3,300	2,800	19,000	Participation of subject matter specialists in co-production, technical support by Our, and Technical Resource Group for LMCS.
	Transfer	-	-	-	-	-	-	
	Procurement	9,000	9,000	9,000	3,000	-	30,000	Technical agencies' training delivery services.
	Workshop and Training	14,340	24,600	10,920	5,920	3,420	59,200	An annual national training.
	Travel	3,051	5,085	1,017	1,017	-	10,170	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		36,237	48,531	30,783	16,783	8,766	141,100	
1.1.3.5	Project Staff	-	13,918	3,918	3,918	3,918	25,672	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in agronomist and resilience.
	Technical Assistance/FLA	-	19,000	10,800	7,200	-	37,000	Subject matter specialists contribute to the TOT module. The consultant develops the TOT module, Customization for scale-up in other regions of the country, and incorporation into Agro-met advisory courses at Agri Universities.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	-	-	-	-	
	Workshop and Training	-	-	4,500	10,500	-	15,000	Cost of a workshop for the development of the TOT module and input collection.
	Travel	-	-	3,000	7,000	-	10,000	Cost of travel for staff, experts and personal related to the development of the TOT module and input collection.
	Miscellaneous	-	-	-	-	-	-	

		-	32,918	22,218	28,618	3,918	87,672	
Total Output 1.1.3		125,541	308,484	251,006	135,316	64,799	885,146	
1.1.4.1								Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts associated with conducting Seasonal Livelihood Programming consultations with the local community and government.
	Project Staff	9,800	13,000	3,200	-	-	26,000	
	Technical Assistance/FLA	14,700	14,700	-	-	-	29,400	Seasonal Livelihood Programming consultation technical guidance and support through domain experts/agencies.
	Transfer	-	-	-	-	-	-	
	Procurement	3,000	3,000	-	-	-	6,000	Equipment, materials, and consulting services for Seasonal Livelihood Programming.
	Workshop and Training	7,500	7,500	1,710	3,990	-	20,700	Cost of the Seasonal Livelihood Programming consultations workshop.
	Travel	3,000	3,000	3,600	8,400	-	18,000	Cost of travel for staff, experts and personal for Seasonal Livelihood Programming.
	Miscellaneous	-	-	-	-	-	-	
		38,000	41,200	8,510	12,390	-	100,100	
1.1.4.2								Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Project Staff	2,535	5,035	5,035	5,035	5,035	22,675	Monitor and facilitate via the channels outlined in section 1.1.3.
	Technical Assistance/FLA	3,000	3,000	3,000	3,000	3,000	15,000	
	Transfer	-	-	-	-	-	-	
	Procurement	-	68,750	68,750	68,750	68,750	275,000	Services provided by multiple CP to distribute LMCS to the designated beneficiaries.
	Workshop and Training	-	1,050	1,050	900	-	3,000	Community-informed training sessions for last mile service communicators.
	Travel	2,000	2,350	2,350	2,300	2,000	11,000	Cost of travel for staff, experts and personal to facilitate and coordinate with a variety of stakeholders and levels, and to ensure that the feedback loop is fully functional.
	Miscellaneous	-	-	-	-	-	-	
		7,535	80,185	80,185	79,985	78,785	326,675	

1.1.4.3	Project Staff	-	6,183	2,183	4,183	4,183	16,732	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts for Sessions
	Technical Assistance/FLA	-	7,725	6,525	7,125	7,125	28,500	Partners on the ground, the IA, and the WFP conduct sessions to determine the best practices and lessons learned.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	-	-	-	-	
	Workshop and Training	-	10,475	3,275	6,875	6,875	27,500	Workshop on the feedback learning loop and M&E findings Workshops for Y2 baseline, Y4 midterm, and Y5 end line.
	Travel	-	1,500	1,500	1,500	1,500	6,000	Cost of travel for staff, experts and personal for learning sessions, annual learning session to document and assess to aid planning
	Miscellaneous	-	-	-	-	-	-	
		-	25,883	13,483	19,683	19,683	78,732	
Total Output 1.1.4		45,535	147,268	102,178	112,058	98,468	505,507	
1.2.1.1	Project Staff	2,535	5,535	2,535	6,035	6,035	22,675	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in resilience assisting the PMU and collaborating with the identified service agency.
	Technical Assistance/FLA	-	3,000	6,000	11,500	9,500	30,000	Subject matter experts invited to present
	Transfer	-	-	-	-	-	-	
	Procurement	14,000	14,000	18,750	18,750	14,000	79,500	Services from technical agencies on co production of LMCS
	Workshop and Training	-	1,500	-	1,750	1,750	5,000	Advocacy events in Y2, Y4 and Y5
	Travel	-	375	4,970	7,064	5,408	17,817	Cost of travel for participating in regional/global conferences
	Miscellaneous	-	-	900	1,200	900	3,000	Advocacy for scale-out costs
		16,535	24,410	33,155	46,299	37,593	157,992	
1.2.1.2	Project Staff	3,935	5,435	5,435	5,435	4,435	24,675	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts work with institutions in the country, organize consultations, prepare materials, and develop institutionalization plans.

	Technical Assistance/FLA	4,500	6,750	6,750	6,750	5,250	30,000	Subject matter experts will create guidelines, manuals, and train government employees.
	Transfer	-	-	-	-	-	-	
	Procurement	10,000	25,000	25,000	25,000	15,000	100,000	All levels of the LMCS will receive institutionalization services.
	Workshop and Training	6,680	9,005	9,005	11,570	4,890	41,150	Training in each of the project districts
	Travel	2,741	3,491	3,491	3,491	2,991	16,205	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		27,856	49,681	49,681	52,246	32,566	212,030	
1.2.1.3	Project Staff	3,935	8,869	7,402	3,467	1,000	24,673	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in resilience Developing ToR for evidence generation in order to conduct research.
	Technical Assistance/FLA	3,000	14,000	14,000	6,000	3,000	40,000	Technical experts will conduct assessments and develop a body of evidence.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	10,000	-	-	10,000	Developing a product
	Workshop and Training	-	900	1,050	-	1,050	3,000	Cost of national workshop
	Travel	-	7,500	7,500	-	-	15,000	Cost of travel for staff, experts and personal for assessment
	Miscellaneous	-	-	-	-	-	-	
		6,935	31,269	39,952	9,467	5,050	92,673	
Total Output 1.2.1		51,326	105,360	122,788	108,012	75,209	462,695	
1.2.2.1	Project Staff	500	8,200	13,500	5,800	1,000	29,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts engaging two national governments, and coordination with other stakeholders..
	Technical Assistance/FLA	-	9,000	9,000	-	-	18,000	Identification of essential forums for sharing and exchanging knowledge, Analyse and investigate existing platforms, weigh their pros and cons, and devise a plan for enhancing/creating new ones.

	Transfer	-	-	-	-	-	-	
	Procurement	-	-	-	-	-	-	
	Workshop and Training	-	-	5,000	-	-	5,000	"Organizing a regional workshop in collaboration with various regional governments and forums. Y1, Y3, and Y5 in Sri Lanka; Y2 and Y4 in India; and 1 international regional knowledge-sharing platform (1 WFP CO, 1 PMU, and 1 EE)."
	Travel	1,594	6,376	7,971	-	-	15,941	Virtual and in-person staff and expert meetings.
	Miscellaneous	400	1,600	2,000	-	-	4,000	Preparatory documentation and printing/recordings
		2,494	25,176	37,471	5,800	1,000	71,941	
1.2.2.2	Project Staff	1,867	6,235	8,102	6,235	8,102	30,541	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts work on creation of forums, encouragement of participation, and documentation of best practices through employee participation.
	Technical Assistance/FLA	-	5,000	7,000	11,000	1,000	24,000	The Mapping and Exchange of Good Practices (MEGP) initiative is launched to reach countries in the region and establish platforms for sharing field experiences/case studies for dissemination.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	7,500	7,500	-	15,000	The creation of knowledge-based products.
	Workshop and Training	-	12,500	12,500	41,000	12,500	78,500	Every other year, districts visit each other and meet WFP project beneficiaries, farmer organizations, and women group leaders as part of a peer exchange and exposure program.
	Travel	-	14,489	16,108	19,347	11,250	61,194	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		1,867	38,224	51,210	85,082	32,852	209,235	
Total Output 1.2.2		4,361	63,400	88,681	90,882	33,852	281,176	
2.1.1.1	Project Staff	14,593	14,593	3,802	1,267	-	34,255	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts conducting Community-based Participatory Planning consultations with the community and government of Sri Lanka

	Technical Assistance/FLA	19,670	22,947	-	3,277	-	45,894	Engagement of technical guidance and support via domain experts/agencies - TRG in stakeholder consultations and awareness raising with the communities and governments of Sri Lanka and India.
	Transfer	-	-	-	-	-	-	
	Procurement	25,875	25,875	-	-	-	51,750	Equipment, materials, and services to conduct stakeholder consultations, create materials, and conduct stakeholder awareness sessions.
	Workshop and Training	27,631	27,631	-	-	-	55,262	Workshop cost for the stakeholder consultations and awareness sessions
	Travel	17,974	17,974	-	-	-	35,948	Cost of travel for staff, experts and personal for the stakeholder consultations and awareness sessions
	Miscellaneous	525	525	-	-	-	1,050	Expenses for supplies and facilities
		106,268	109,545	3,802	4,544	-	224,159	
2.1.1.2	Project Staff	20,035	23,837	2,535	1,267	-	47,674	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in resilience, agronomy, and livelihoods.
	Technical Assistance/FLA	7,785	15,569	11,677	3,892	-	38,923	FLA with local partner for participatory community engagement.
	Transfer	-	-	-	-	-	-	
	Procurement	15,094	15,094	-	-	-	30,188	Conduct planning with a communication agency for material development.
	Workshop and Training	28,004	31,512	-	1,754	-	61,270	Orientation of key implementers and organizing the sessions
	Travel	3,189	8,568	-	2,689	-	14,446	Cost of travel for staff, experts and personal associated with multi-hazard climate-risk-informed local climate change adaptation planning.
	Miscellaneous	1,838	1,838	525	525	525	5,251	Expenses for supplies and facilities
		75,945	96,418	14,737	10,127	525	197,752	
2.1.1.3	Project Staff	21,400	21,400	6,400	6,400	6,400	62,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in watershed and resilience.
	Technical Assistance/FLA	25,125	40,125	15,000	-	-	80,250	Conducting an assessment of the condition of irrigation structures, calculating the requirements for restoration and rehabilitation, and drafting plans with community input.
	Transfer	-	-	-	-	-	-	

	Procurement	26,275	26,275	-	-	-	52,550	Equipment's, material, services (Consultants) for social and environmental studies.
	Workshop and Training	8,000	8,000	-	-	-	16,000	Cost of the social and environmental studies workshop.
	Travel	2,575	13,600	1,575	-	-	17,750	Travel by PMU and WFP personnel in support of the evaluation and planning
	Miscellaneous	1,650	1,650	600	600	600	5,100	Stationery and other resources and facilities expenses.
		85,025	111,050	23,575	7,000	7,000	233,650	
2.1.1.4	Project Staff	7,269	13,365	3,846	1,500	750	26,730	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	6,000	12,000	12,000	-	-	30,000	Training provided by cooperating partners or the executing agency.
	Transfer	-	-	-	-	-	-	
	Procurement	788	1,313	263	263	-	2,627	Material expenses for the community.
	Workshop and Training	3,000	6,000	1,200	1,200	600	12,000	Cost associated with community education and demonstrations.
	Travel	4,784	7,974	2,939	250	-	15,947	Cost of travel for staff, experts and personal conducts orientation sessions on MIS and record keeping for various aspects of the program.
	Miscellaneous	-	-	-	-	-	-	
		21,841	40,652	20,248	3,213	1,350	87,304	
2.1.1.5	Project Staff	11,400	15,600	3,000	3,000	3,000	36,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	5,602	7,469	5,602	-	-	18,673	Consultations with specialists for the compilation and evaluation of traditional adaptation practices.
	Transfer	-	-	-	-	-	-	
	Procurement	17,220	25,830	-	-	-	43,050	Engagement of technical agencies for evaluation of best practices, compilation development, and training modules.
	Workshop and Training	10,000	15,000	-	-	-	25,000	Organizing a workshop on validation.
	Travel	5,034	6,879	4,034	-	-	15,947	Cost of travel for staff, experts and personal

	Miscellaneous	840	1,260	-	-	-	2,100	Cost of related inputs/stationery and field proceedings recordings.
		50,096	72,038	12,636	3,000	3,000	140,770	
2.1.1.6	Project Staff	11,668	22,036	14,735	5,867	4,367	58,673	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in agronomist and resilience building.
	Technical Assistance/FLA	3,403	12,562	1,575	525	263	18,328	Assistance from technical agencies and agricultural universities in the development and implementation of specific modules.
	Transfer	-	-	-	-	-	-	
	Procurement	3,600	14,400	-	-	-	18,000	The creation of materials and teaching aids.
	Workshop and Training	25,769	58,923	38,654	5,500	-	128,846	Number of GAP-related trainings and workshops for farmer groups. The staff travels.
	Travel	3,540	8,750	5,310	100	-	17,700	Cost of travel for staff, experts and personal
	Miscellaneous	1,280	2,885	1,920	315	-	6,400	Material development and training contingencies.
		49,260	119,556	62,194	12,307	4,630	247,947	
Total Output 2.1.1		388,435	549,259	137,192	40,191	16,505	1,131,582	
2.1.2.1	Project Staff	8,602	19,962	14,172	8,438	5,625	56,799	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in resilience, livelihoods.
	Technical Assistance/FLA	14,359	21,539	14,359	21,539	-	71,796	Coordination with government departments, banks, and microfinance institutions for potential linkages and support aligned with the government's existing programs. Organization of fairs across the project districts with participation from farmers. Guidelines and Standard Operating Procedures are developed.
	Transfer	-	-	-	-	-	-	
	Procurement	-	23,925	28,763	14,513	9,675	76,876	Linking the majority of marginal farmers/tribal communities to banks for financing/risk insurance across GPs, based on the gaps, utilizing technological advances, and documenting the outcomes.
	Workshop and Training	-	-	-	-	-	-	
	Travel	-	6,924	7,024	300	200	14,448	Cost of travel for staff, experts and personal
	Miscellaneous	-	450	675	675	450	2,250	Tents/booths, material display, and other arrangements as required.

		22,961	72,800	64,993	45,465	15,950	222,169	
2.1.2.2								Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Project Staff	5,346	10,946	13,746	13,746	10,946	54,730	
	Technical Assistance/FLA	6,000	15,375	17,063	5,063	3,375	46,876	In collaboration with national Institutes for sustainability and scale-up, training modules and a learning management system will be developed for access across the 3 states / 6 districts.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	-	-	-	-	
	Workshop and Training	-	28,500	42,750	17,100	11,400	99,750	Women's self-help groups and farmer groups receive training.
	Travel	2,200	9,000	11,300	300	200	23,000	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		13,546	63,821	84,859	36,209	25,921	224,356	
Total Output 2.1.2		36,507	136,621	149,852	81,674	41,871	446,525	
2.2.1.1								Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in watershed management and resilience building providing overall facilitation of technical contributions, preparation and evaluation, approval of budgets, supervision and general overview of the restoration phase, contribution to restoration training for participants, after-completion assets O&M and sustainability plan & execution, as well as community training, etc., and ongoing support to achieve the desired outcomes.
	Project Staff	19,100	47,600	47,600	19,100	9,600	143,000	
	Technical Assistance/FLA	59,615	238,462	238,462	59,615	-	596,154	Technical guidance and implementing agency for the restoration of minor/micro-irrigation tanks in the district utilizing the catchment area method the wage employment was augmented by cooperating partners to maximize benefits directly to the community, and the implementing agency provided technical support.
	Transfer	79,730	318,920	318,920	79,730	-	797,300	Rehabilitation of irrigation tanks (Community water reservoirs and their associated infrastructure and ecosystem);- CBT and irrigation structures
	Procurement	30,363	140,300	140,300	39,788	-	350,751	NFI - working and O & M equipment, planting material, etc.

	Workshop and Training	11,040	44,160	44,160	11,040	-	110,400	Agricultural education and training.
	Travel	3,189	12,758	12,758	3,189	-	31,894	Overall technical oversight of the restoration works to ensure compliance with technical and other quality standards.
	Miscellaneous	1,000	1,250	1,250	1,500	-	5,000	Costs for unanticipated expenses/first aid kit, etc.
		204,037	803,450	803,450	213,962	9,600	2,034,499	
2.2.1.2	Project Staff	17,235	51,735	51,735	17,235	5,735	143,675	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in in resilience providing facilitation to the HH to finalize adaptation options, recommendation of customized technical packages, and ongoing Support
	Technical Assistance/FLA	45,000	135,000	180,000	90,000	-	450,000	FLA for HH farms with water & soil conservation/harvesting facilities developed to benefit farmers - through cooperating partner leveraging MGNREGS planning and implementation.
	Transfer	73,750	295,000	295,000	73,750	-	737,500	HH Water collection systems and farms with soil and water conservation techniques
	Procurement	23,250	75,900	93,000	40,350	-	232,500	Tools, plants, seeds, and other inputs are required to implement the adaptation alternatives.
	Workshop and Training	12,480	49,920	49,920	12,480	-	124,800	Trainings, workshops, and field trips to learn and implement adaptation strategies.
	Travel	2,589	10,358	10,358	2,589	-	25,894	Beneficiaries' out-of-district exposure visits and technical experts' travel for technical support and to ensure quality, support, and achievement of results.
	Miscellaneous	500	2,000	2,000	500	-	5,000	For first-aid kits and educational materials at the site.
		174,804	619,913	682,013	236,904	5,735	1,719,369	
2.2.1.3	Project Staff	-	15,000	15,000	15,000	15,000	60,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in facilitating the trainings and workshops, local awareness and input into the development of training modules, and regular follow-up on the application of newly acquired skills.
	Technical Assistance/FLA	-	5,000	5,000	5,000	5,000	20,000	The details, terms of reference, and policy implications will be guided by specialists.
	Transfer	-	-	-	-	-	-	
	Procurement	-	-	-	-	-	-	
	Workshop and Training	-	52,125	52,125	52,125	52,125	208,500	Two study tours in each country to facilitate the exchange of knowledge.

	Travel	-	13,750	13,750	13,750	13,750	55,000	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		-	85,875	85,875	85,875	85,875	343,500	
Total Output 2.2.1		378,841	1,509,238	1,571,338	536,741	101,210	4,097,368	
2.2.2.1	Project Staff	34,019	49,692	8,019	-	-	91,730	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	-	-	-	-	-	-	
	Transfer	-	-	-	-	-	-	
	Procurement	108,150	188,350	-	-	-	296,500	Assessment of the value chain for 10 priority commodities at various levels
	Workshop and Training	-	-	-	-	-	-	
	Travel	6,400	14,600	-	-	-	21,000	Cost of travel for staff, experts and personal
	Miscellaneous	-	-	-	-	-	-	
		148,569	252,642	8,019	-	-	409,230	
2.2.2.2	Project Staff	20,200	25,400	20,200	4,600	4,600	75,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	7,500	22,500	45,000	-	-	75,000	Strengthening Farmers organizations / Producers' groups in districts on climate-sensitive diversified livelihoods, cropping, and the development of sustainable mechanisms in collaboration with cooperating partners and government institution technical experts.
	Transfer	-	-	-	-	-	-	
	Procurement	25,308	33,744	25,308	-	-	84,360	inputs for capacity strengthening and service provision from government departments and private sector for farmer organizations and producer groups
	Workshop and Training	17,769	38,308	61,615	-	-	117,692	For effective diversification of livelihoods, training programs for knowledge and behaviour modification, analysis of livelihood options, and cost-benefit analysis are required.
	Travel	2,653	7,460	14,419	-	-	24,532	Cost of travel for staff, experts and personal

	Miscellaneous	220	220	220	220	220	1,100	Stationary
		73,650	127,632	166,762	4,820	4,820	377,684	
2.2.2.3	Project Staff	13,316	19,974	19,974	6,658	6,658	66,580	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts
	Technical Assistance/FLA	4,440	19,860	19,860	8,820	2,220	55,200	Value addition and provision of facilities
	Transfer	-	-	-	-	-	-	
	Procurement	21,366	41,454	41,454	20,088	13,818	138,180	Organizing fair trades in the project districts
	Workshop and Training	11,445	19,733	19,733	12,135	7,005	70,051	Organizing skills training programmes by government and private service provides
	Travel	2,200	5,300	5,300	6,100	2,100	21,000	Cost of travel for staff, experts and personal
	Miscellaneous	-	800	800	400	-	2,000	Stationery and training material
		52,767	107,121	107,121	54,201	31,801	353,011	
2.2.2.4	Project Staff	8,602	24,602	24,602	10,867	-	68,673	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in livelihoods, resilience building, and value chain.
	Technical Assistance/FLA	16,615	36,390	36,390	15,426	-	104,821	Identify inputs, value addition, and facilities necessary for post-harvest management in collaboration with cooperating partners.
	Transfer	-	-	-	-	-	-	
	Procurement	38,365	390,192	275,096	80,000	-	783,653	Acquisition of infrastructure, equipment, and small machines for processing, and establishment of infrastructure for beneficiaries (women's self-help groups)
	Workshop and Training	25,154	33,538	25,154	-	-	83,846	Workshops and trainings for beneficiaries and producer groups/SMEs on alternative climate-resilient livelihoods and improved post-harvest facilities.
	Travel	2,353	12,166	7,460	2,553	-	24,532	Cost of travel for staff, experts and personal
	Miscellaneous	2,000	3,200	3,200	2,600	2,000	13,000	Invest in electricity in case of solar equipment failure and other raw materials based on the community of choice.
		93,089	500,088	371,902	111,446	2,000	1,078,525	

2.2.2.5	Project Staff	6,800	20,400	20,400	13,600	6,800	68,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in supply chain and livelihoods.
	Technical Assistance/FLA	6,420	19,260	19,260	12,840	6,420	64,200	Cost allocation for SPMU personnel, including subject matter experts-supply chain and livelihoods.
	Transfer	-	-	-	-	-	-	
	Procurement	3,000	9,000	9,000	6,000	3,000	30,000	Partnership with a private sector entity for a web-based marketing and branding platform
	Workshop and Training	16,444	49,332	49,332	32,888	16,444	164,440	Organize workshops/trainings to strengthen the value chains selected and negotiations with formal market actors.
	Travel	2,453	7,360	7,360	4,906	2,453	24,532	Cost of travel for staff, experts and personal of various stakeholders, cross-learning, and the sharing of effective models.
	Miscellaneous	1,480	4,440	4,440	2,960	1,480	14,800	Hygiene protocols and SOPs are created/printed based on preference.
		36,597	109,792	109,792	73,194	36,597	365,972	
2.2.2.6	Project Staff	7,200	20,000	21,600	16,000	7,200	72,000	Staff costs allocation of national, state and sub-national Implementation leads, coordinators, implementation managers and experts in supply chain and livelihoods.
	Technical Assistance/FLA	1,480	16,440	16,440	14,960	13,480	62,800	Partnership with a private sector entity for a web-based marketing and branding platform
	Transfer	-	-	-	-	-	-	
	Procurement	2,200	12,299	12,299	10,099	7,900	44,797	Partner with agencies to provide youth and women with technical support, incubation, and mentoring
	Workshop and Training	4,500	22,620	22,620	18,120	13,620	81,480	Implementation of 54 travel programs for women and youth N/SPMU.
	Travel	100	4,695	4,695	4,595	4,495	18,580	Cost of travel for staff, experts and personal
	Miscellaneous	444	2,442	2,441	1,990	1,540	8,857	Resource /reference material access
		15,924	78,496	80,095	65,764	48,235	288,514	
Total Output 2.2.2								
		420,596	1,175,771	843,691	309,425	123,453	2,872,936	
Project Execution Cost								
National Project Co-ordinator		19,300	42,460	46,706	51,376	42,386	202,228	
Communications and Reporting Associate		4,789	21,072	23,179	25,497	21,035	95,572	
Business & Finance Support Assistant		6,225	13,695	15,065	16,571	13,671	65,227	
National Project Co-ordinator		14,530	31,966	35,163	38,679	21,274	141,612	

Business/Finance Support Assistant	5,862	12,896	14,186	15,605	8,583	57,132	
Information Systems and Reporting Associate	11,447	25,183	27,701	30,471	16,759	111,561	
Gender Officer	7,915	17,414	19,155	21,071	11,589	77,144	
Office equipment and running cost	98,249	37,797	37,797	37,797	22,652	234,292	
Travel	4,500	6,500	6,500	6,500	5,781	29,781	
Total Project Activities Cost (Component 1 and 2) =A	1,771,228	4,430,409	3,394,572	1,492,426	620,020	11,708,655	
Total Project Execution Cost = (B)	172, 817	208,983	225,452	243,567	163,730	1,014,549	
Total Project Cost = (A+B)	1,944,045	4,639,392	3,620,024	1,735,993	783,750	12,723,204	
MIE Project Cycle Management Fee=(C)	194,405	463,939	362,002	173,599	78,375	1,272,320	
Total amount of funding requested (A+B+C)	2,138,450	5,103,331	3,982,026	1,909,592	862,125	13,995,524	

Project Cycle Management Fee charged by the Implementing Entity

Cost	Total
Project Governance - Steering Committees	
Regional Project Steering Committee (RPSC)	35,500
National Adaptation Project Steering Committee (NAPSC)	7,500
State Project Steering Committee	2,000
District Project Implementation Committees (PIC)	2,500
Technical Advisory Committee (TAC)	2,500
Evaluation and Knowledge Management Advice	
M&E Officer	67,712
Inception workshop and reporting	15,000
Baseline study	80,000
Mid-term review	40,000
Endline and Final Project Evaluation and Report	135,422
Audit and Inspection Support	
Final Audit	30,000
Information and Telecommunication Support – covered by WFP	-
Procurement Support – covered by WFP	-
Human Resources Support – covered by WFP	-
Regional Sub Total	418,134
Programme and Performance Management Support and Supervision	854,187

Evaluation and Knowledge Management Advice	
Legal Support	
Audit and Inspection Support	
Finance and Budget Support and Supervision	
Indirect Support Cost (ISC) Sub Total	854,187
MIE Project Cycle Management Fee	1,272,320

Breakdown of costs for the ISC fee	
Finance and Budget Support and Supervision	<ul style="list-style-type: none"> • General oversight and supervision, management and quality control • Ensure compliance with WFP judiciary standards and internal control processes, relevant international and national regulations and Adaptation Fund's rules and policies • Manage, monitor and track financial transactions • Manage all Adaptation Fund financial resources
Programme and Performance Management Support and Supervision	<ul style="list-style-type: none"> • Technical support, troubleshooting, and support missions as necessary • Specialized policy, programming and implementation support services • Provide guidance in establishing performance measurement processes • Supervision of overall project implementation • Ensure coordination with other WFP projects in India and Sri Lanka
Information and Telecommunications Support	<ul style="list-style-type: none"> • Includes maintaining information management systems and specific project management databases to track and monitor project implementation
Evaluation and Knowledge Management Advice	<ul style="list-style-type: none"> • Technical support in methodologies, innovative solutions, validation of Terms of Reference, identification of experts, results validation and quality assurance • Supervision of preparation of annual project reports and project evaluation reports and quality control
Audit and Inspection Support	<ul style="list-style-type: none"> • Ensure compliance with audit requirements • Ensures financial reporting complies with WFP and Adaptation Fund standards • Ensure accountability and incorporation of lessons learned
Legal Support	<ul style="list-style-type: none"> • Legal advice to assure conformity with WFP legal practices and those of India and Sri Lanka and contract review

G. Disbursement schedule with time-bound milestones

The schedule of disbursement of funds aligns with the broad implementation schedule and fund requirements.

	Upon Agreement Signature	One year after Project Start	Two years after Project Start	Three years after Project Start	Four years after Project Start	Total
Scheduled date	January 2023	January 2024	January 2025	January 2026	January 2027	
Project Funds (USD)	1,944,045	4,639,392	3,620,024	1,735,993	783,750	12,723,204
Implementing Entity Fee	194,405	463,939	362,002	173,599	78,375	1,272,320
TOTAL	2,138,450	5,103,331	3,982,026	1,909,592	862,125	13,995,524

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government

AF guidance: Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project / programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:

Dr. Anil Jasinghe, Secretary, Ministry of Environment of Sri Lanka	Ms. Richa Sharma, Additional Secretary, Ministry of Environment Forest and Climate Change
Date:	Date:

B. Implementing Entity certification

<p>I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (<i>Climate Change Policy (2012), the National Adaptation Plan for Climate Impacts (2016-2025), the National Climate Action Plans prepared by the Ministry of Environment, National Climate Change Adaptation Strategy for Sri Lanka 2011-2016-Ministry of Environment, National Disaster Management Policy of Sri Lanka</i>) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>	
<p>Andrea Berardo a.i. WFP Representative Sri Lanka.</p>	<p>Bishow Parajuli WFP Representative India.</p>
Date:	Date:
Tel. and email: +94 112 555250 (ext.2110) andrea.berardo@wfp.org	Tel. and email: +91 11 46554000 (Ext 2100) bishow.parajuli@wfp.org
Project Contact Person: Rushini Perera	Project Contact Person: Pradnya Paithankar
Tel. and Email: +94 112 555250 (ext.2000) rushini.perera@wfp.org	Tel. and Email: +91 11 46554000 (Ext 2700) pradnya.paithankar@wfp.org

नीलेश कुमार साह
संयुक्त सचिव
NEELESH KUMAR SAH
JOINT SECRETARY



पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
भारत सरकार
Ministry of Environment, Forest and Climate Change
Government of India

Letter of Endorsement by the Government of India

8th August 2022

To:

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for Full Proposal: Strengthening resilience of vulnerable communities in Sri Lanka and India to increased impacts of climate change.

In my capacity as Designated Authority for the Adaptation Fund in India, I confirm that the Full Proposal of the above regional project is in accordance with the Government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in India.

Accordingly, I am pleased to endorse the above concept note with support from the Adaptation Fund. If approved, the project will be implemented by UN World Food Programme and executed jointly by the Government of India based on the priorities in this sector.

Yours sincerely,

(Neelesh Kumar Sah)
Joint Secretary

Ministry of Environment, Forest and Climate Change
Agni Wing, 2nd Floor, Indira Paryavaran Bhawan
Jor Bagh, New Delhi – 110003
Tel: + 91 11 246 95130
Email: sahnk@cag.gov.in





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சுற்றுடல் அமைச்சு
Ministry of Environment

"සොබාදාම පියා", අංක 416/ජ/1, රොබට් ගුනාරත්න මාවත, බත්තරමුල්ල, ශ්‍රී ලංකාව.

"சொபாதம் பியா", இல. 416/ජ/1, ரொபர்ட் குணவர்தன மாவத்தை, பத்தரமுல்லை, இலங்கை.
"Sobadam Piyasa", No. 416/C/1, Robert Gunawardana Mawatha, Battaramulla, Sri Lanka.

Gen. Tel. +94-11-2034100

දුරකථන

රජයාණන්
Secretary

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தொலை நகல்
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මගේ අංකය
எனது இல
My No

04/04/07/272-II

ඔබේ අංකය
உமது இல
Your No

දිනය
திகதி
Date

27.07.2022

The Chairman
The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat

Dear Sir,

Endorsement for Regional Project on "Strengthening resilience of vulnerable communities in Sri Lanka and India to increased impacts of climate change"

In my capacity as designated authority for the Adaptation Fund in Sri Lanka, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Sri Lanka.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by United Nations World Food Programme and executed by the Government of Sri Lanka.

Thank you

Yours sincerely


Dr Anil Jasinghe
Secretary

Dr. Anil Jasinghe
Secretary
Ministry of Environment

Annex 1 Full gender assessment conducted during Full Proposal development

Purpose of the Gender Assessment

Climate change affects women and men differently. Strategies on climate change adaptation need to take into account the different socio-economic context, roles and knowledge that women and men have in agricultural production or other livelihoods in their communities, which affect their access to resources, skills, entitlements and thus ability to develop their own adaptive capacity to withstand climate change. The purpose of this Gender Assessment is to provide gender-disaggregated information to inform the design of the regional Adaptation Fund project under development for Sri Lanka and India. It seeks to provide information on the different needs, capabilities, roles and knowledge resources of women and men, and to further fine-tune project activities to promote gender equality.

Structure and process of the Gender Assessment for the Adaptation Fund Regional Project

The full Gender Assessment carried out to inform the full proposal development of the Adaptation Fund Regional Project for Sri Lanka and India, entitled 'Strengthening resilience of vulnerable communities in Sri Lanka and India to increased impacts of climate change' consists of the following components:

- A. Initial Gender Analysis conducted for the Concept Note;
- B. Gender Assessment conducted in India during full proposal development;
- C. Gender Assessment conducted in Sri Lanka during full proposal development; and
- D. Regional high-level summary of full Gender Assessment.

A. Initial Gender Analysis conducted for the Concept Note

Gender and development

Sri Lanka: Overall life expectancy at birth in Sri Lanka is 77 years, with women having a higher life expectancy of 78.6 compared to 72 years for males (calculated between 2011 and 2013).²³⁰ Out of the 8.6 million economically active population, 64 percent are males and only 35 percent are females. Women constitute 52 percent of Sri Lanka's population but make up only 5.3 percent of representatives in parliament. Despite Sri Lanka's achievements in human capital development that favour women, such as high levels of female education and low total fertility rates, the low female labour force participation rates persist. These are caused by a combination of household roles and responsibilities; women not acquiring the proper skills demanded by job markets; and gender bias in hiring procedures.²³¹ Women are more likely than men to be facing multidimensional poverty and near multidimensional poverty.²³² Gender inequalities are likely to be higher in parts of the Dry Zone, where there is a larger number of women headed households (reportedly 30 percent, compared to a national figure of 22 percent of all households),²³³ and a greater proportion of women taking care of people with disabilities and chronic diseases (especially the high incidence of chronic kidney failure affecting male farmers in the north and north central regions).

While Sri Lanka is nearly self-sufficient in rice, the staple food, and animal protein products such as fish and poultry,²³⁴ it nevertheless has one of the highest rates of acute moderate malnutrition (wasting) in the world – 15 percent prevalence – which WHO defines at the "critical" threshold level. Micronutrient deficiencies, especially anaemia, also remain a concern as they affect all age groups. Overnutrition is rapidly emerging, with 45 percent of women of reproductive age overweight or obese.²³⁵ Approximately one third of the population in the Northern and Uva Provinces and half in the Eastern Province cannot afford the minimum cost of a nutritious diet. Rising commodity prices, partially attributable to increasing production costs, disproportionately affect women and the poor.²³⁶

A key point highlighted in a recent gender responsive analysis²³⁷ is that by and large, the budgets of Sri Lanka's MoA, DoA and DoAD are more than 98 percent gender blind, which has not supported the reduction of gender disparities in the agriculture

²³⁰ <http://www.statistics.gov.lk/GenderStatistics/StaticInformation/Population/LifeExpectancyatBirthbySex1920-1922to2011-2013> accessed 01/02/2021.

²³¹ Solotaroff, Jennifer L., George Joseph, Anne T. Kuriakose, and Jayati Sethi. 2020. Getting to Work: Unlocking Women's Potential in Sri Lanka's Labor Force. Directions in Development. Washington, DC: World Bank.

²³² FAO. 2018. Country Gender Assessment of Agriculture and the Rural Sector in Sri Lanka. Colombo.

²³³ Sri Lanka: Strengthening the Resilience of Post Conflict Recovery and Development to Climate Change Risks in Sri Lanka." [www.undp.org. https://info.undp.org/docs/pdc/Documents/LKA/SCCF Approved Prodoc.pdf](https://info.undp.org/docs/pdc/Documents/LKA/SCCF Approved Prodoc.pdf).

²³⁴ WFP Sri Lanka Country Strategic Plan, 2018-2022.

²³⁵ Sri Lanka DHS 2016.

²³⁶ WFP Sri Lanka Country Strategic Plan, 2018-2022.

²³⁷ Perera, S. (2019) Gender Responsive Analysis of the 2018 Budget of the Agricultural Sector with a specific focus on Department of Agriculture and Department of Agrarian Development. Prepared for the Delegation of the European Union to Sri Lanka and the Maldives.

sector. Gender 'neutrality' has neither promoted gender equitable engagement of women and men in the projects, nor has it ensured equal benefits to them.

India: Life expectancy at birth in India is 69.7 years, with females achieving 71.46 years and males at 68.37.²³⁸ Females constituted 48.59 percent of the population in 2016.²³⁹ India's rank of 123 on the GII reflects the ongoing need to improve gender equality, as women do not benefit equally in economic opportunities, or in parliamentary representation (Table 1). The increase in the literacy rate to 77.7 percent in 2017 from 72.98 percent in 2011 has not yet closed the gap between male (84.7 percent) and female (70.3 percent) literacy;²⁴⁰ nor between the urban and rural areas. In the latter, the literacy rate was 80.7 per cent among males compared to 64.5 per cent among females.²⁴¹ The unemployment rate among rural male youth (persons of age 15-29 years) was 16.6 per cent while the unemployment rate among the rural female youth was 13.8 per cent during 2018-19.²⁴² At 2.2 children per woman, the country is close to achieving the replacement level of fertility.²⁴³

While India has had some remarkable successes with respect to food security in recent years, it is still home to one quarter of all the world's undernourished people. Poor rural households spend more than 60 percent of their incomes on food²⁴⁴ and have limited access to diversified foods such as pulses, vegetables, milk and fruits. 38.4 percent of children under 5 are stunted and 21 percent wasted; according to the World Health Organization (WHO) classification, these rates are at "very high" and "emergency" levels, respectively. Although there are no significant differences between genders in malnutrition rates among children, higher mortality rates among girls and the fact that there are more boy children than girl children are indicative of serious bias against girls at the household level. The prevalence of micronutrient deficiencies is also high, with anaemia affecting more than half of women aged 15-49 years and of children aged 6-59 months and 22.7 percent of men aged 15-49 years. The double burden of malnutrition is on the rise, with 20.7 percent of women and 18.6 percent of men being overweight or obese.

Summary: Despite positive development gains, the project localities in Sri Lanka and India share similar characteristics with respect to gender inequalities, with women more likely than men to be poor. Sri Lanka ranks 90 (out of 189) on the 2019 Gender Inequality Index (GI), while India ranks of 123. While at the national level Sri Lanka has a higher score on the GI, the above analysis reflects the need for more progress on gender equality in the rural districts of the Dry Zone.

Effects of the Covid-19 pandemic

The COVID-19 crisis has caused sharp jobs and earnings losses, as well as market instability and disruption. The lower middle-income \$3.20 poverty headcount in Sri Lanka is projected to increase from 8.9 percent in 2019 to 13 percent in 2020. In India, the same measure is projected to increase from 40.9 percent in 2019/2020 to 46.2 percent in 2020/2021²⁴⁵. While childcare and eldercare responsibilities have increased for everyone during the lockdown, women – who are often more vulnerable to climate change - have disproportionately felt the burden of increased care work.²⁴⁶ Covid-19 is expected to worsen the overall prospects for food security and nutrition, potentially affecting areas and groups of people not traditionally affected by food insecurity. Immunization, nutrition and other vital health services have been severely disrupted by the pandemic, which potentially threatened the lives of up to 459,000 children and mothers in South Asia over the last six months of 2020.²⁴⁷ People who have lost their jobs through Covid are part of the new vulnerable.

Gender and climate change

The selected regions of both countries share many of the same climate risks and impacts, including increasing average temperatures, more frequent and intense heat waves, increased variability of rainfall from the south-west and north-east monsoons, as well as tropical cyclones originating from the Bay of Bengal. In Odisha, the combination of high poverty levels and high percentage of indigenous communities with high natural resource dependency make the state extremely vulnerable to climate change.²⁴⁸ All the districts in Sri Lanka's Dry Zone that have been developing in recent decades have been battered by recurrent cycles of floods and drought in the last decade, with severe impacts on food security, nutrition, and income, particularly for those living in remote border districts.²⁴⁹

Gender roles associated with the food production cycle lead to differential gender impacts of climate change-induced food insecurity.²⁵⁰ Women in the south Asian region have higher levels of vulnerability given their social roles of caring for the family, providing food, fetching water and fuelwood, caring for livestock/poultry, farming, gathering forest produce, etc. The

²³⁸ Projected for 2016-2020 period; Report Of The Technical Group On Population Projections, Nov 2019, MoHFW.

²³⁹ MoSPI (2019) 'Men and women in India'.

²⁴⁰ MoSPI (2019) 'Men and women in India'. http://www.mospi.nic.in/sites/default/files/publication_reports/Women_and_Men_31_%20Mar_2020.pdf

²⁴¹ MoSPI (2019) 'Periodic Labour Force Survey Annual Report, July 2017 – June 2018'.

²⁴² MoSPI (2020) Periodic Labour Force Survey, July 2018 – June 2019.

²⁴³ UNFPA Country Programme for India 2018-2022.

²⁴⁴ National Sample Survey Office. 2014. Nutritional Intake in India 2011-12.

²⁴⁵ World Bank (2020) Beaten or broken? Informality and Covid. South Asia Economic Forecast Fall 2020.

²⁴⁶ South Asia Gender Innovation Lab. Policy Brief, August 2020.

²⁴⁷ Unicef (2020) 'Lives upended: how Covid-19 threatens the futures of 600 million South Asian children'. June 2020.

²⁴⁸ Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023.

²⁴⁹ GoSL and UNDP (undated) Technical Feasibility Report for GCF proposal 'Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management'.

²⁵⁰ Chanana et al. 2018. Integrating Gender into the Climate-Smart Village Approach of Scaling out Adaptation Options in Agriculture. https://cgspace.cgiar.org/bitstream/handle/10568/96274/Infonote_gender_CSV.pdf

²⁵¹ Parikh, J. Is climate change a gender issues? https://www.undp.org/content/dam/india/docs/is_climate_change_gender_issue.pdf

common social positions of women as caregivers, homemakers, and food, water, and wood producers and gatherers, they are said to experience the effects of climate change more often and therefore have reason to find ways to adapt and promote sustainable solutions.²⁵² In cases of crop failure due to harsh climatic conditions, cultural factors often make it easier for men to leave their farms in search of employment elsewhere, leaving women behind to struggle to feed their families and make ends meet. In many cases, women have diminished assets and resources to help them plan for and potentially avert the next crisis. Women also respond with different coping mechanisms than men.²⁵³ Diverse gender-based barriers (including restrictive sociocultural inhibitions) in accessing land, financial services, social capital, credit and technology render women vulnerable to food insecurity, which is exacerbated by climate change. The measures such promotion of traditional crops such as millets has multiple advantages- nutritional and climatic- but it increases the drudgery in terms of post-harvest processing. The farm implements and machines help reducing the women's time and efforts²⁵⁴.

Countries in the south Asian region have recognised the need for gender-sensitive climate mitigation and adaptation activities. For example, India welcomed the Gender Action Plan under the Paris Agreement following COP-21, which incorporates gender analysis and gender-responsive programmes for climate adaptation and mitigation.²⁵⁵

Key points from the community consultations

The community consultations that were carried out during development of the Concept Note (CN) are detailed in section II.I of the CN. These revealed that while women and men in general perceived the same climatic changes in their localities, there were differences in the strategies adopted to cope with negative impacts. Both men and women farmers identified unpredictable monsoons, increasing drought and dry spells, shift in sowing period, excessive rain and flooding, more heatwaves, and increased soil and water salinity as direct climate risks, as well as poor human health and vegetation changes. Specific impacts noted include increased crop loss and indebtedness, rural-urban migration, increased cost of the food basket over the last decade (SL). COVID-19 caused an additional sharp increase in food prices that negatively affected household expenditure patterns, especially in the dry season. SL community consultations identified people with chronic kidney disease (high incidence in farming areas), chronic diabetes, and pregnant mothers as vulnerable groups.

Men tended to migrate to non-farm sectors in other states/countries, while women responded by diversifying homestead gardens with trees and vegetables for regular income, and by seeking off-farm employment from government schemes, for example, India's MGNREGA. Both women and men farmers across the targeted dryland areas of the two countries reported changing individual agronomic practices, e.g. to long-term crops like coconut intercropped with cowpea or groundnut; and by increasing the number of goats and poultry to reduce the crop cultivation risks. They also borrow money, often from local money lenders, leading to increasing levels of indebtedness. These decisions are also governed by changing socio-economic issues such as access to labour in households, etc. In Matale district, dry zone division of Wilgamuwa, in response to the lengthening of the food-insecure season, farmers sell valuables and productive assets as a coping strategy and also increase their indebtedness. Among vulnerable households, the educated youth leave for employment in nearby towns. In some areas, migration due to climate stress has become rampant (e.g. Puri district of Odisha).

Gaps and needs

Many gaps and needs identified through the community consultations were common to women and men. The consultations revealed limited access to extension services and information; and that awareness and access to different entitlement schemes and services are inadequate. Regarding climate information services, villagers have access to generic climate information through mass media (TV and radio), but this is not adequate to meet the challenges in the existing livelihoods. Community consultations confirmed the need for access to reliable forecast information along with location-specific advisories at a lead time of one to two weeks, which are necessary to manage the homestead and livestock - make decisions on which crops to plant and by when, arrangements for fodder, vaccination, etc. Oxfam studies conducted in Odisha show that women have considerably less access than men to critical information on weather alerts and cropping patterns, affecting their capacity to respond effectively to climate variability. At the same time, there are valuable opportunities as women and youth can be effective change agents and can play a strong role in communication of climate information products and services, as well as for dissemination and motivation on climate-resilient and diversified livelihoods, if sufficiently empowered and supported.

There is broad demand for enhanced climate services, but dissemination will require careful planning. During community consultations in Matale district, dry zone division of Wilgamuwa, SL, the majority of farmers did not especially regard weather advisories as they do not receive detailed or localised information, but mainly more generic radio and TV broadcast of weather advisories. There is limited mobile network penetration and very low mobile signal coverage in the locality and smart phones are virtually unavailable. No specific gender differences in this regard were reported from the SL consultations.

²⁵² Roy, A. 2018. Making Climate Action Count: Mainstreaming Gender in Climate Action to Accelerate Climate Compatible Development. ORF Occasional paper. https://www.orfonline.org/wp-content/uploads/2018/11/ORF_OccasionalPaper_174_Climate-Gender.pdf

²⁵³ FAO. 2010. Farmers in a changing climate. Does gender matter? Food security in Andhra Pradesh, India. <http://www.fao.org/3/i1721e/i1721e00.pdf>

²⁵⁴ Impact of Reduced drudgery of women in production and post-harvest processing of small millets: Working Paper MMSRF 2016

https://www.researchgate.net/publication/301656237_Impact_of_Reduced_drudgery_of_women_in_production_and_post-harvest_processing_of_small_millets

²⁵⁵ Submission by India on SBI Agenda Item 20: Gender and Climate Change <https://www4.unfccc.int/sites/SubmissionsStaging/Documents/201804051550--India%20Gender%20submission.pdf>

Both women and men identified the need for restoration of village irrigation reservoirs and provision of check dams to store the freshwater from the rains, which helps to reduce the soil and water salinity. Water management was the main issue identified by the all farmers consulted in SL. Consultations underlined the need for awareness on various facets of climate change for women and men, as well as changes to agronomic practices e.g. developing saline-tolerant crop varieties, more environmentally sound production approaches, and reviving traditional knowledge – for example, that associated with pest control, which appears to have been lost over the generations. Community consultations confirmed the need for livelihood diversification and provided examples of existing activities e.g. women engaged in mat and basket preparation from palmyrah leaves, limited income due to limited market, as well as availability of the leaves (TN); noted that people depend on small-scale trading and fishing due to reduced paddy production (Odisha); called for building capacities for cashew nut cultivation, floriculture (Odisha). Women particularly called for the diversification of women's livelihoods by increasing their skills in non-farm and off-farm enterprises including tailoring, processing of primary agro-products, etc (SL, Odisha, etc). The consultations confirmed the need for increasing access to formal credit linkages at low interest rates, especially for women to diversify their agricultural livelihoods from farming to processing.

Conclusion and recommendations

This initial gender analysis has provided clear evidence of different gender roles, activities, needs, and available opportunities and challenges or risks for men and women. The detailed gender assessment to be carried out during full proposal development will deepen this evidence to further optimise the project's activities, as well as to help to identify how changing gender dynamics might drive lasting change. This preliminary gender analysis has highlighted a number of opportunities for the project to intervene to drive greater gender equality, with the following key recommendations made:

- *Develop and scale out last mile climate services:* Both women and men expressed demand for targeted agro-met advisories, developed and disseminated with community involvement, to help them be more responsive and adapt to seasonal changes. Activities must be designed to overcome the fact that women have considerably less access than men to critical information on weather alerts and cropping patterns, affecting their capacity to respond effectively to climate variability.
- *Ensure equitable participation of women and vulnerable groups in adaptation planning:* To promote empowerment and agency, as well as lead to more appropriate and sustainable adaptation implementation, the project should ensure that women and vulnerable groups, including youth, the elderly, woman-headed households and people with disabilities, are empowered and facilitated to participate equitably in the community-based adaptation planning processes, and equitably supported to implement their identified adaptation solutions. This can be extended to supporting women and youth to be effective change agents on climate-resilient livelihoods.
- *Integrate labour-saving approaches:* Women expressed strong demand for labour-saving approaches and machinery (such as milling machines) to reduce the drudgery in their daily lives and help them to add value to agricultural products and thus increase their incomes. This represents an opportunity for the project to make a significant difference to the lives of women, and thus their households. It is recommended that this area is further explored during the detailed gender assessment, so that the appropriate labour-saving approaches and machinery are identified, together with the optimal delivery mechanisms.
- *Ensure that nutrition interventions specifically target women and children:* Women and children in general bear the brunt of the nutritional deficiencies identified. Thus the project should have a focus on promoting climate-resilient and nutritious food production and value addition to such foods and ensure that project activities are designed so that women and children benefit from these activities in a targeted way.
- *Implement livelihoods diversification to promote gender equality and climate resilience:* Detailed project planning should include considering the range of opportunities identified for diversification of women's livelihoods for greater climate resilience, by increasing their skills in non-farm and off-farm enterprises, and how best to support these in the project localities.
- *Strengthening sex-disaggregated monitoring:* it is recommended that the project strictly maintain sex-disaggregated data and that ongoing monitoring facilitates evidence on differential impacts that the project will have on women and men, and promotes taking action on this evidence.

B. Gender Assessment conducted in India

B.1. Introduction and methodology

The gender assessment was conducted to understand gender roles, issues, inequalities, differential needs, barriers preventing women's participation and overall current situation, and to fine-tune project activities to address the identified differentiated needs and to ensure that women and other groups can

participate equitably in and benefit equitably and substantially from the project activities. The gender assessment was conducted as part of the other field assessments conducted during full proposal development, as summarised in Part II.J of the proposal.

The methodology included both primary and secondary data collection and desk review. Primary data collection entailed firstly developing and using a number of data collection tools, including for semi structured interviews with key informants, as well as specific data collection tools for focus group discussions (FGDs) to undertake the gender assessment: the Gender Assessment Tool and the Gender-mainstreamed Seasonal Livelihood Calendar. Gender was also mainstreamed into the FGD for the agriculture and fishing communities and into the tool for assessment of climate information services, and the tool for assessing knowledge and access to financial services and government schemes). Two FGDs were conducted in each locality, with one of them exclusively for women, to provide them with an equitable opportunity to raise their voices and be heard. While the FGDs for the gender assessment might have some overlapping discussions with those under other types of FGDs in the community consultations schedules, it focused exclusively on women-centric gender roles, issues, inequalities, barriers and vulnerability to various risks/shocks, including climate variability. The 12 FGDs for the Gender Assessment were carried out over a period of 60 days, between February and April 2022.

- In Andhra Pradesh (AP), FGDs were conducted in Puligundlapalli and Vepamanupeta village in Anantapur district and in Cheropalle and Katamayakunta village in Kadapa district. Most FGD participants in Puligundlapalli village belonged to the OBC category (Other Backward Class), whereas in Vepamanupeta most participants were from general caste category. Cheropalle had a mix of participants from both these case categories, whereas in Katamayakunta most participants belonged either to OBC or Scheduled Caste.²⁵⁶
- In Odisha, FGDs were conducted in Kotipadar and Rundi village in Naupada district, and Michasola and Taragaon in Kalahandi district. Most FGD participants belonged to the scheduled tribe category except in Kotipadar village where all participants were from OBC category.
- In Tamil Nadu (AP), FGDs were conducted in Kalappampadi and Hanumanthapuram village in Dharmapuri district and in Kodipangu and Andanayagapuram village in Ramanathapuram district.

Climate change is an important global environmental challenge adversely impacting agricultural production and rural livelihoods. The impacts are different in varied biophysical, and socio-economic conditions, especially among agro-ecosystems, age groups, class, caste, gender. However, people who are already marginalized and vulnerable due to existing structural causes will be impacted more. In case of agriculture, both men and women are likely to be affected, however, due to existing gender inequalities in agriculture sector, impact will be more among female farmers which further affects their lives and livelihoods.

Women comprise about 42 % of the agricultural labour force in India, owning less than 2 % of its farm land. Women farmers in India are largely engaged in non-mechanized, labour intensive farm operations. They are engaged in production, distribution and utilization. The main roles in crop production are transplanting/sowing/dibbing, weeding, harvesting in production phase and cleaning the threshing yard, winnowing, seed storage and management. While in animal husbandry they are engaged in feed management and grazing, cleaning the sheds, animal care, milk collection and marketing. Their role in small holder farming is increasing given the upward trend of men moving out to non-farm sectors. The data from Census of India clearly shows the changes. In 1991 there were four females in the agricultural labour force for 10 males while it was increased to six females for every 10 males in 2011. According to Agricultural Census 2015-16, there has been an increase in the share of female operational holders from 12.79 % to 13.96% between 2010-11 to 2015-16. The operational area has also increased from 10.36% to 11.72% for the same period. It implies clearly that more female farmers are joining in the independent operation and management of lands. On the livestock sector, there has been increase in the population between 2012 to 2019 according to the Livestock Census 2019. Milch animals have increased by 6%, 10.1% goat, 14.1% sheep and 45.8% increase in the backyard poultry. The NSSO report (2014) shows that livestock production is an important household enterprise for women next to

²⁵⁶ Other Backward Class is a collective term used by the Government of India to classify castes which are educationally or socially disadvantaged. It is one of several official classifications of the population of India, along with General Class, Scheduled Castes and Scheduled Tribes (SCs and STs). The OBCs were found to comprise 55% of the country's population by the Mandal Commission report of 1980, and were determined to be 41% in 2006 when the National Sample Survey Organisation took place. 'Scheduled Caste' are officially designated groups of people, now sometimes referred to as Dalit, and among the most disadvantaged socio-economic groups in India.

crop cultivation. The data reveals that 14.7% percent of rural women are self-employed in livestock farming while it was only 2.9% of self-employed male workers.

B.2 Status of female farmers in the study sites

The operational holdings of female farmers are predominantly less than two ha across the study states. The table 1 clearly point out that 97 % of women-owned landholdings in Andhra Pradesh, 93.82% in Odisha and 94.07 % in Tamil Nadu are under the class of marginal and small holdings. This restricts them to have inadequate marketable surplus to compete in the market, depend more on intermediaries to market these products and thus realize very less profit. With reference to land holding size between male and female, at all India level, the average size of women's land holding is 0.93 ha when compared to 1.18 ha for men.

Table 1. Size-class wise Number and Area of Female Operational Landholders in Andhra Pradesh, Odisha and Tamil Nadu, 2015-16 (Percentage)

Sl. No	Type of Holding	Andhra Pradesh		Odisha		Tamil Nadu	
		Number	Area	Number	Area	Number	Area
1	Marginal	72.28	34.58	77.68	48.41	81.38	42.06
2	Small	18.51	30.66	16.14	29.00	12.69	26.47
3	Semi-Medium	7.58	22.89	5.32	16.63	4.65	18.69
4	Medium	1.52	9.69	0.83	5.19	1.16	9.71
5	Large	0.01	2.17	0.03	0.78	0.12	3.07
6	All Classes	100	100	100	100	100	100

Source: India Agriculture Census, 2015-16

Apart from number and size of the holdings, women's land ownership is an important determining driver for the cropping systems, technology adoption, accessing the schemes and expanding institutional linkages, accessing institutional credits, ensuring active participation in the capacity building programmes, taking part in the value chain activities. In the state of Odisha only 4.1% of women have land in their names which is far below the national average of 14 % (Agriculture Census, 2016). While it is higher in other two the states; 17.8% in Tamil Nadu and 23.70% in Andhra Pradesh.

The ownership of land for women is a key factor associated with decision making to cultivate climate resilient crops such as millets/pulses/oilseeds and cropping systems including agro-forestry and engaging in animal husbandry activities. Land ownership provides decision making rights to choose suitable crops like millets and pulses, as well as cropping systems like mixed cropping, border cropping, and agroforestry systems. Other decisions include the land allocation of food crops as opposed to commercial crops and most importantly traditional varieties. Women being predominantly responsible for feeding the livestock, lack of such decision-making rights within the household over allocation of area for forage crops and trees, spend more time and labour on collecting fodder from fields or tending the animals for grazing.

In the recent past, women farmers and landless labourers have participated in training programmes organized by the line departments under schemes, such as ATMA in Dharmapuri, Odisha Millet Mission in the study districts of Andhra Pradesh, Natural Farming Scheme in Cuddapah. However, women and landless laborers face constraints when accessing entitlement schemes including subsidies for new agricultural technologies and services, since land ownership records are the basic collateral for entitlement access and are predominately male-dominated. Similarly to accessing entitlement schemes, land records are a precondition to access other government schemes, such as those in micro irrigation and farm machinery, as well as the Mahatma Gandhi Rural Employment Guarantee Scheme. Overall, the land ownership system is a significant impediment to women farmer's access to technologies and associated services like training and institutional linkages.

B.3 Position of women in livestock enterprises

Livestock production is emerging as a coping strategy for women farmers across the study sites. They primarily own and engaged in livestock enterprises namely small-scale dairy, goat/sheep and backyard poultry is primarily held and managed by women across the field sites. Although poultry and goat/sheep rearing are common across both landed and landless households, dairy is managed only in landed

households. Women are largely engaged in both production and marketing activities. Their participation and contribution in the higher levels of value chain is less, when compared to their contribution in production phase, which is inadequate but fundamental for gender transformative livelihoods.

Even at the production phase of the value chain itself where they are active, women do not have adequate access to technologies and training in breed, feed and animal health management, financial resources and scientific know how to realize maximum efficiency. The low milk productivity in cattle, weight gaining rate in goat/sheep and poultry are linked to gender-based inequalities in access to and control of productive resources, services and institutional linkages. On same line, the involvement and control over decision-making among women on production are less due to their lack of access to veterinary services, technologies and institutional linkages.

B.4 Gender roles and needs

Odisha: In Odisha field sites, both men and women participate in agriculture but have different roles. Almost more than 90% are small and marginal farmers. They cultivate paddy, vegetables and mushroom and rear cattle, goat and poultry at smaller scales. In paddy cultivation men generally take a lead and engaged in ploughing, planting, and fertilizers application, while women perform transplanting, weeding, harvesting post-harvest operations. In case of vegetables and mushroom cultivation women take a lead and take the support of men for ploughing and other labour needs in weeding and harvesting.

Firewood collection is done by both men and women where men engage in chopping firewood and women in carrying it back. Women also perform non-farm labour in construction work during the lean seasons in nearby villages. The collection of Non Timber Forest Products (NTFPs) and making value added products like bamboo baskets is done mostly by women in the study villages, except in Kotipadar village where NTFP collection is not undertaken. Adolescent girls are engaged in sorting, drying and storing the NTFPs, which form an important source of supplementary income for the declining agricultural productivity as well as during monsoon failures. However, lack of marketing facilities for the same was reported as a major challenge by women.

Women reported that both men and women consult each other in the households while making decisions in agriculture. All of them are part of self-help groups, access credit and regularly meet. However, due to lack of financial literacy they could not access credit from formal financial agencies.

They do not have access to climate information and advisory services. As women do not have access to mobile phones, they could not hear the calls and due to lack of reading skills they could not read messages. In case of men, though they are receiving the advisories they could not adopt it in the field. During the discussion both men and women reported that they need training to make use of the agro-advisories and climate information.

In Kotipadar, women are engaged in vegetable and mushroom cultivation to supplement the family income and food security needs. It emerged from the FGDs that in order to support the family against declining agricultural productivity in paddy and pulses, women opted for diversification to reduce risks in farming by cultivating vegetables for small but regular income and to support household consumption. In Kotipadar, women have formed a producer organization to sell vegetables. However, they lack access to reliable market, good prices for their produce and timely sale of vegetables. As the vegetables and mushrooms are perishable, they could not have access to any storage infrastructures to store and sell, or reach wholesale markets due to less quantity or know any value addition technologies, products and markets.

Tamil Nadu: In Ramanathapuram district in Tamil Nadu, the predominant agricultural activities are the cultivation of paddy or cotton during the main monsoon season and small-scale vegetable cultivation in the summer season. In farming, men collect and organise the necessary inputs from agro-input dealers, they plough and prepare the field for planting, apply fertilizer, and spraying. While women engage in sowing, transplanting, weeding, harvesting and farm cleaning activities, as well as producing value added products like mats/baskets during lean seasons and collecting firewood throughout the year. In cases where men are regular workers in cotton mills, for example, women tend to work on the family farms, take care of small-scale livestock, and work as wage labourers on other farms. However, due to extreme events and continuous crop failures men have been migrating to nearby cities for jobs, which has increased women's burden and time poverty to maintain both household work and agriculture field activities. As men migrate to non-farm sectors outside the village, women are also responsible for maintaining kinship relations by visiting relatives house on marriages and other social/cultural functions.

Women also participate in SHG group meetings and are sometimes able to make decisions on household activities. Despite the fact that women contribute undertake significant daily agricultural activities, men lead in decision making on farm operations and marketing. as the deed to the land is in their names. In some cases, although women may own the land, men still have full control over economic decisions and women are restricted to domestic day-to-day work. Adolescent girls also support in household maintenance, such as fetching water, cleaning, washing clothes and preparing food. Apart from agriculture and livestock, women are engaged in tailoring, preparing and selling value added products from milk and going to MGNREGS work within the village. These income-generating activities are especially important, as the region is drought-prone which affects sustainable agricultural work. At the household, women have access and control over from the primary sources, men have control to spend money from the secondary income sources.

High temperatures and below normal rainfall coupled with uneven distribution within monsoon season are the main climate risks in the region. In such times, both primary and secondary income sources are adversely affected. Women are forced to seek employment in nearby villages/towns. In consultation, women shared that they foresee water scarcity for irrigation and health issues in drinking water and heat, as well as the threat of pest and disease outbreaks. The village uses traditional collective resource management practices and systems, such as tank management. Additionally, both women and men participated in watershed development works to ensure drinking water. Women and men also come together to plan for the village festival, where women lead in some of the community-based activities related to food and drinking water, while men collaborate with external stakeholders and make strategic decisions, like claiming insurance for crop failures and demanding water for agriculture from tanks. This showcases that even when women participate at the community level decision-making and activities, they are still relegated to reproductive tasks. Women spend the money from their earnings, they also save some of their earnings in the groups. As many women are starting to contribute to household income, men are happy to share household finance management with women. However, men have control over money when the quantum of money is more. Although women are part of the SHGs, they lack financial literacy and their institutional linkages with formal banking and financial services is limited. They depend on men to access financial services like receiving individual loans and making insurance claims. Regarding climate information their only source is television, however it would not help them to take any decisions in agriculture management. However, farmers who own smart phones can access daily weather reports for general information. Right now, farmers from the study villages have not registered with Kisan portal to receive the forecast and advisory services. The knowledge and skills on climate information services are limited but they are willing to attend the training to use it and subscribe to the climate information services.

Women farmers expressed that they need access to irrigation sources, household based enterprises to diversify their livelihoods, guidance on financial services, insurance schemes to overcome climate induced disasters and improve the assets for themselves and their children.

In the case of Dharmapuri district in Tamil Nadu, women are engaged in both productive and social reproductive tasks. The main productive works are small scale dairy, goat and poultry apart from contributing to certain tasks in crop cultivation such as planting, weeding and harvesting of vegetables, paddy, millets and pulses. Although the cropping pattern has changed recently, as during drought periods, men undertake commercial cropping with limited involvement from women. Instead, they concentrate on livestock and poultry in their home. Compared to dairy, the focus on poultry is declining. Men are active in agriculture especially high value export oriented vegetable cultivation. While women are engaged in activities supported by SHGs such as tailoring and garment making, working as labourers in MGNREGS. Educated women are working as part time shop assistants in local or nearby villages as an additional source of income. Within agriculture men farmers are involved in the purchase of seeds, planning and organizing the agriculture labours for field preparation, fertilizer application, spraying, marketing the products, whereas women are involved in sowing, transplanting, weeding, cleaning works and harvesting vegetables and fruits. Men have control over farm operations where irrigation facility is available and they take all the decisions related to crop choices, management and marketing. Women are rarely involved in decision making and their contribution is restricted to labour for the certain activities. While women have access to dry lands where millets are cultivated in the main monsoon season followed by the cultivation of horse gram. Women face issues in decision-making in agriculture like farm management and marketing in the village of Kallappanpady. In the village of Hannumanthapuram 40% of the women showed more interest in farm management and marketing of their agricultural products. Women members are part of SHGs and have access to informal financial services. Women in the FGDs stated that they have freedom to spend the amount saved in the SHG if the amount is less. If it is more than Rs 5000/ men have full control over it.

Climate change is commonly identified using indicators, such as rise in temperature which can lead to water scarcity, drought, failure of monsoon rainfall, seasonal pest attacks, and diseases. They expressed that climate change will adversely impacts their livelihoods, intensify irrigation issues, increase soil salinity and lead to the loss of native crops, due to shift in rainfall pattern coupled with extreme events.

During disaster situations, like seasonal drought, women support farm work and also receive credit from SHGs to manage the crisis. Women have freedom to spend the money for the good cause from their secondary source income. Some of them started savings from their secondary income source. Men indicated that they appreciate the financial savings of women and are also happy that women are supporting household finance management.

Women have less knowledge on financial services in both villages and they do not have a strong network facility within the group to access formal institutions and authorities. Resultingly, they depend on men in their household, especially to access banking and financial services, namely credit and insurance.

Both men and women receive climate information from television news, word of mouth, and local agricultural programmes or events. Similar to Ramanathapuram, farmers are not subscribing the climate information service, but are willing to undergo training to use the services. Women require training to improve their financial literacy and agricultural skills to better manage the climate risks.

Andhra Pradesh: Here agriculture and livestock are the key economic activities. In cropping men are involved in ploughing, irrigation, vet care and marketing the products. While women are mainly associated with livestock care, transplanting, weeding, harvesting vegetables and social reproduction activities. Specifically, women are preferred over men for deseeding and sowing in groundnut, transplanting of paddy and planting of vegetable seedlings, weeding and harvesting in all crops, staking of tomato plants, and watering the animals. Seasonal drought is the most experienced extreme event in the village. Women have issues related to fetching water while men also face challenges to access fodder. Both experience severe stress during seasonal drought. Men have the responsibility to arrange the necessary financial resources for the family. Women face drudgery works like weeding in paddy, groundnut and maize crops, while men face health hazards during the application of chemical sprays. As the deed of the land is in men's names, there is no recognition for women's contribution in agriculture. Men lead on marketing and do not share the transactions and profits with women. Other secondary economic activities for middle aged men are working as construction and stone cutting labourers. Many young men migrate to Anantapur and Bengaluru as technicians and skilled labourers. Women used to take up tailoring which can be managed from the house.

Seasonal drought also leads to water shortages for irrigation and livestock which has implications on farm employment and the loss of standing crops, including grownup trees (mango). The beneficiaries consulted perceive increased droughts, heat waves and high temperatures as future climate threats, which also may negatively affect the availability of fodder and water for livestock and agriculture. Also sometimes high intensity rainfall leads to top soil erosion which is more serious as the soil depth is very low (30 to 45 centimetres). Short duration crops like groundnut and paddy are severely affected due to erratic rainfall and leads to reduction of food crops in the village. Mostly now many farmers are shifting to tree based horticulture crops like mango, sapota and jamun.

Women actively participated in the watershed development projects implemented in the village to promote green fodder and construction of farm ponds. Men farmers collectively purchasing fodder from neighbouring districts to address fodder scarcity is a frequent community initiative.

Women have more access to formal financial institutions like SHG, banks and diversified income sources by investing in livestock and poultry. Women take more control over the financial things during drought situation. Sometimes, men migrate to nearby towns, and women resultingly have increased responsibilities to manage the household. Men face challenges when crops fail to repay loans from banks or cooperative societies.

Currently, men farmers receive climate and agriculture advisory received by villagers only in Puligundlapalli village from Reliance company, Anantapur. Also they receive SMS, newspaper and television which are generic messages. In the past some farmers experienced the value of the forecast, as both women and men farmers resultingly used precautionary measures to avoid livestock diseases. In agriculture, recommendations for pests and disease were utilised by very people.

Specific needs for both women and men farmers are adequate quantities of drinking water and fodder (dry and green) for livestock, user friendly livestock insurance and uninterrupted power supply for irrigation.

Specific needs of women farmers include measures to recognise them as farmers and the introduction of joint land titles to increase women's ability to access loans and credits, as well as their importance legally at the household and societal level. Women also would like the creation of diverse employment apart from farming within 30 kilometres from the village, such as agro processing or in the garment sector.

B.5 Differentiated impacts of climate variability on the gender roles in the communities of the project

The experiences of the impacts of climate variability on the livelihoods across the field sites for women and men are different, which in part is due to the different biophysical and natural resources and socially/culturally constructed roles and responsibilities.

1. Irrespective of the study sites, both women and men have limitations in accessing and using the CIS. The agro-advisories and forecast information do not largely cover women's specific needs. As it is evident that women largely depend on crops like vegetables and livestock for their economic activities apart from contributing labour to the family farm. However, women have less access to agricultural extension services, skill training, information, institutional linkages, land, water resources, financial resources and services, entitlement schemes and market access. In addition, they have additional responsibilities of social reproduction and care works and are also bounded by social and cultural norms with reduced mobility. Therefore, they are more vulnerable to the adverse impacts of climate variability and change. They have inadequate capacities to bounce back, adapt and rebuild their livelihood assets and strategies. The individual's socio-economic vulnerability and capacity to adapt to the changing climate are governed by the level of different capitals and assets, sources of income and potential to diversify the livelihoods. The livelihood asset base of women is less compared to men except in social capital. Therefore analysing how these variations affect the women and men farmers to adopt to adaptation technologies and practices is essential.
2. Across field sites the changes in the cropping systems and livestock practices as reported above are changing gender roles. Women are entering managerial and decision-making roles. However, access to some of the productive resources, such as land, loans and education, intensifies the negative impacts of climate change to their livelihoods and reduces women's farmers ability to cope.
3. Changes in alternate employment sources and value of work: Men are migrating to non-farming sectors and higher-paying jobs in nearby towns and cities. However due to household responsibilities, care work responsibilities and mobility restrictions compounded by patriarchal social norms, women are only able to seek employment in the local village itself, where there are less high-paying jobs.
4. Women focus on small scale regular income earning practices like vegetable cultivation, mushroom production, millet and dry land pulses production, while men focus on high value vegetables, paddy and agro-forestry based cropping. Also, in Dharmapuri district men focus on high value vegetables after their access to government schemes, whereas women do not have any work, and instead look for wage work on other farms.
5. Regarding social capital, women rely on SHGs to share and learn and access financial services, as well as to share labour and seeds. Men do not have much interest to act in such platforms and rely on social capital.
6. Access to water: The changes in the rainfall pattern and continuous droughts directly impact the availability of water especially ground water. This has implications on women's work burden and health due to more time and energy spent on fetching water. At the same time in Andhra Pradesh, men have additional responsibilities to source fodder and ensure finance meets household needs. But men have limited access to formal financial institutions to avail crop loans as they have mandatorily cleared their past dues. In other field sites, the burden rests on women and they take risks by borrowing from the SHGs.
7. Continuous droughts and seasonal flooding affects soil health and surrounding biodiversity. There has been less attention to the restoration of water sources, which has negative impacts on productivity and other ecosystem services. In the case of Andhra Pradesh recent floods have

eroded the topsoil and in Ramanathapuram long duration droughts have increased the area under fallow land. This affected the local production and employment opportunities especially for women within the village.

B.6 Existing Coping mechanisms of women vis-à-vis men to the observed changes in the climate

The loss of crops/trees or reduction in productivity due to climate change adversely impacts their household income, food and nutrition security and both men and women lose their capacity to invest in the next season. However, men and women undergo different coping mechanisms to the changes in climate that are context specific.

1. **Diversification of sources of household income:** The first and foremost shift to meet the loss of income and its stability, men are migrating to non-farm sector to provide regular income. In all three states depending upon their education and skill sets youth are migrating to urban locations (in all locations it is quite common now), whereas middle-aged men shift to construction industries and other service sectors in nearby towns and cities. In Ramanathapuram, Cudappah and Ananthapur districts middle-aged men are migrating to the southeast and Gulf countries. Women are constrained by their household and care work, as well as levels of education and lack of access to education, so they seek employment opportunities within the village or nearby locations like working as labourers on other farmers, investing time in livestock and seeking work from MGNREGS. The wages for these tasks are very low compared to the men working in other sectors as well as locations. In the case of Ramanathapuram and two districts in Andhra Pradesh, women and men of all ages are involved in seasonal employment and temporary outmigration when there is severe seasonal drought due to monsoon failure in the region or any other calamities in the region.
2. **Investing in assets to build irrigation and efficient use:** The second most striking impact of climate change is access to water for irrigation. Both women and men farmers are adopting micro irrigation technologies. Many of them have accessed it through government schemes, however women who are independent operators faced issues accessing schemes because of issues in owning land, accessing loans and credit, and they could also not afford to lose wages in the follow up processes after submitting the application. Also, households mobilise financial resources either through SHG loan or other means to own irrigation source by constructing borewells.
3. **Changes in the cropping pattern and livestock resources:** A third change is in cropping pattern and integration of livestock resources. Farmers shifted to cotton instead of paddy in Ramanathapuram, vegetables in Dharmapuri, two districts of Andhra Pradesh and vegetables and mushroom in the two districts of Odisha. Although it reduces risks in farming in many contexts it replaces the food crops like millets, paddy and pulses which has implications on household food and nutrition security
4. **Strengthening off-farm enterprises:** The fourth coping mechanism identified is the intensification or increased focus on livestock such as dairy, goats and poultry. Through women SHGs they have built their assets and established institutional links for feed, veterinary care and market access by creating milk collection centres. Apart from this, women have been engaged in tailoring, basket making, NTFP's value addition, and garland making. Such location specific additional enterprises are to be identified and trained with necessary backward and forward linkages.
5. **Changes in the agronomic practices and cropping systems:** Other common coping strategy across sites are shifting to short duration varieties especially in paddy and pulses, cultivating vegetables for markets, adopting mulching technologies and adding more organic manures to improve the soil health. This has negative implications on traditional paddy varieties adapted to the region as well as millets. Most importantly they are shifting to agro-forestry models with the trees such as mango, sapota, jamun and guava for example.
6. **Strengthening insurance for crops and animals:** All the farmers are now aware and with the support of Dept of Agriculture and Animal Husbandry they are insuring their crops and animals to overcome the adverse effect of crop/animal loss. Women farmers have limitations in comparison to men to access insurance and government schemes.
7. **Women's participation in SHGs:** Women's participation in SHGs is a risk-addressing strategy, wherein women ensure their access to financial resources from banks and their own savings. By this way they leverage the benefits to address some of the climate induced risks in agriculture.

B.7 Recommended approaches to address the climate change related gender disparities

The increasing role and contribution offered by rural women in smallholder agriculture gives opportunities to meaningfully impact sustainable food systems with resilience at the individual, organizational and system level. As climate change has gendered impacts among farmers, the recommended technologies and practices of climate adaptation and mitigation strategies are to be carefully informed by an intersectional context-specific gender analysis before implementation. Such strategies should not continue or reproduce existing gender and social inequalities. Hence collective learning among field level practitioners and researchers is necessary. This is to share, learn and build from previous experiences and action research to develop gender sensitive and responsive approaches. Such an approach is needed to promote social and gender equality, while building women's and men's adaptive capacities and resilience.

1. Given the status of pre-existing gender inequalities at the planning phase design the programme/project needs to adopt a gender-sensitive approach by fostering more opportunities and resources for the vulnerable section of the target groups.
2. As they start considering the issues discussed in the FGDs, the programmes need to focus on five key dimensions to build women's agency for gender equality and build resilience to tackle escalating climate risks: strengthening women's decision-making capacity, facilitating collective actions, expanding institutional linkages, augmenting their access to productive resources and reducing their work burdens through appropriate farm machinery solutions.
3. Considering the lower proportion of women's land ownership in the study states, namely Odisha and Tamil Nadu, the group approach, i.e. promoting collectives like FPOs for women, are recommended to enable the necessary productive resources access to women farmers. Detailed mapping of backward, forward and lateral linkages will support them to build their capacity and leadership. This helps to build social capital through collective/group structures as the existing social relations and associated institutions that support them in climate risks are disappearing in rural areas.
4. As men increasingly migrate to non-farm sectors, considering the growing feminization of small and marginal farms, policies to get 'farmer' status among women is essential. Since all the entitlement schemes and programmes are linked to land ownership, currently they are largely neglected which is linked to adoption of technologies and their active participation in the value chains. Since it is a political decision, it may take more time, meanwhile appropriate measures to bring women farmers on board is necessary. Making such decisions requires holistic thinking, so women's participation, decision making and agency can be improved to address challenges of the climate change.
5. Facilitating access to institutional credits for men and women producers is important. Given the current condition, women are part of SHGs in all three states, which plays a key role in mobilizing credit for agriculture and at the critical times of crop failures. In the coming years, as extreme events and climate risks are expected to increase, as will demand for access to credit. Hence, promoting financial literacy linked with Kisan credit cards for women especially will help them access timely credit at reasonable rates without utilizing informal lending sources.
6. The uptake of available climate information services by men and women farmers is low, despite multiple strategies to raise awareness, as well as increase access to timely CIS, locale specific agro and livestock advisories and build their capacity to use the advisories. This is a priority and requires more attention, especially for women farmers. Also, here in addition to spatial scale, expanding the forecast lead time from 5 days to 10 to 15 days helps farmers to take some strategic decisions in the field. The provision of community cadres which facilitate farmer to farmer learning and exchange of information can be institutionalized through farmer collectives rather than with technical institutions who can work in partnership with farmer collectives.
7. Access to diversified employment opportunities are needed by women across the study sites in order to reduce the climate-induced risks in farming. Currently investments in livestock is working well, however this is not relevant for individuals involved in non-farm enterprises. Hence efforts should be prioritised, especially for women farmers, to build the value chain with risk mitigating measures in different phase of the value chain and capacity to act in the higher levels of value chain. Further for practical reasons it can be linked with farmer collectives.
8. Livelihoods diversification can also be promoted through integrated farming systems in which crop cultivation is supplemented with allied enterprises with back ward and forward linkages. Here, agro-

forestry with suitable multipurpose tree species are promoted with technologies that helps to reduce the shade impact to the main crops. Due care is needed to select tree species that are locally adapted and for which propagation can be facilitated at the local level by building the skills of landless women to product seed lines. Crop diversification should be informed by consultations with women farmers in the community and that it supports their specific needs

9. From community discussions, it came up clearly that access to small scale irrigation is a sustainable solution to diversify and intensify the production systems coupled with efficient irrigation methods like micro irrigation. Hence investments to promote both on-farm rainwater harvesting measures as well as public and common land resources-based systems are necessary. In most of the sites, ground water is the primary source, in the context of varied rainfall measures to continuous recharge and ensuring community based management is necessary.
10. In the context of increasing rate of feminization of small farms, promoting sustainable agriculture production practices requires attention for low cost effective technologies rather than recommending standard production technologies which highly depend on external chemical inputs.
11. Related to this point, access to user friendly farm machinery services for women would support the intensification of production processes rather than leaving the land fallow. Custom hiring centres encompassing tools and machinery are needed in the region, with sufficient training to manage the centres with long term technical support. Also, train a cadre of women in using the machinery which will generate additional employment and groom them as entrepreneurs with skilled employment.
12. As women members have expressed the need for capacity building on improved technologies and use of CIS, the mode of organizing the training programmes is crucial to enable women's active participation. Experiences show that timing, venue, gender of the trainer/facilitator, localizing the technical contents, post training support services, and ensuring minimum of 60% women's participation are some points can be considered at the design and implementation process. Here targeting approach to ensure social inclusiveness helps to reach out women-headed households and widowed or divorced or unmarried women, SC/ST women and other marginalized sections in the community.
13. Developing strategies to promote women's leadership and skills in decision making bodies at the community level needs attention. Local level leadership facilitates and promotes horizontal learning and practices to reduce the gender gaps from the bottom-up.
14. The prevailing environmental and socio-economic context further intensify the challenges faced by women in farming. Most importantly, natural resources, namely landscape, soil, water and biodiversity are under severe degradation due to both climate and non-climate factors causing negative impacts on important ecosystem services. This in turn causes distress to both women and men farmers by adversely influencing the productivity and increasing the cost of production. While women are taking a lead in farming, evolving a basket of locally appropriate climate smart agriculture technologies with the technical support of multi-disciplinary experts for holistic planning for resource conservation and higher productivity with is needed.
15. Further, the changing agrarian and rural social structures are adding stress to both women and men farmers; wherein the traditional socio-economic safety nets such as community seed, labour and water sharing and management practices require additional support.
16. Promote solar based irrigation pumps by appropriately linking available central and state schemes to ensure power supply for irrigation in the rural areas.
17. Reduce the drudgery of women in firewood collection both in Odisha and Ramanathapuram by increasing their capacity to access clean fuels. Though many women have accessed the relevant schemes, they might not have used with regular refills due to many reasons. Those areas are to be analysed and suitable solutions are evolved.

C. Gender Assessment conducted in Sri Lanka

C.1 Introduction

South Asia is likely to sustain larger economic losses from climate change than most other areas in the world. Moreover, those losses—the collective effect of impacts on agriculture, tourism, energy demand, labor productivity, catastrophic risks, health, and ecosystems—may be larger than previously

estimated.²⁵⁷ Sri Lanka faces extreme weather events and natural hazards, including droughts, floods and landslides, which particularly affect the rural vulnerable households, including those headed by women or those including people with disabilities or older persons. Being an island, Sri Lanka is one of the countries that is most vulnerable to climate change, which is expected to increase the frequency and severity of extreme weather events. This poses a serious threat to the livelihoods of households living below or just above the poverty line.²⁵⁸

Research has shown that women and men face different vulnerabilities, risks, and impacts based on their gender, with implications for their coping strategies and overall well-being. In many societies, women and girls bear the brunt of household chores in addition to caring for children and older persons, household food production, water and wood gathering. Many of these inequalities can increase vulnerabilities to climate shocks, given many women and girls may lack appropriate access to early warning information, to financial services, to participation in community decision-making and resource allocation, and to rights that govern property and mobility.²⁵⁹

The assessment was conducted with the primary focus of capturing gendered implications of climate change and how climate change and adaptation affect women, men, girls and boys differently within the pre-set targeted project districts - Mullaitivu, Vavuniya, Trincomalee, Monaragala, Kurunegala, Mannar.

C.2 Assessment Approach and Methodology

The assessment methodology included a desk review of existing published data and information which was subjected to subsequent validation through Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs). The FGDs were conducted in person while KIIs were conducted via telephone.

The assessment was conducted with the primary focus of capturing gendered implications of climate change and how climate change and adaptation affect women, men, girls and boys differently within the pre-set targeted project districts - Mullaitivu, Vavuniya, Trincomalee, Monaragala, Kurunegala, Mannar.

The methodology of the assessment followed a compilation and analysis of both primary and secondary data. A significant component of data and information were gathered in the form of secondary data via research publications, journal articles and government statistical archives. Subsequently the gathered secondary data were subjected to a process of validation through KIIs and FGDs.

The methodology followed a purposive sampling technique for primary data collection. A FGD would not exceed 10 members. All interviews and discussions were conducted in local languages with assistance from professional translators where necessary. A structured questionnaire was used to guide the FGDs, KIIs and targeted consultations.

The assessment was conducted in three stages

1. Desk review - compilation of existing information
2. FGDs with selected community groups from project districts - Mullaitivu, Vavuniya, Trincomalee, Monaragala, Kurunegala, Mannar.
3. Consultations with the State Ministry of Women and Child Development (MWCD), Climate Change Secretariat, Ministry of Agriculture

After each FGD, separate sub discussions were conducted with youth and women separately. A total of six main Focus Group Discussions (FGDs) and an addition 12 sub-FGDs were conducted in Polpithigama (Kurunegala District), Vavuniya South, Karachchi (Kilinochchi), Kinniya (Trincomalee), Musali (Mannar) and Madulla (Monaragala). The FGDs had a total representation of 89 women and 22 men. In addition to a main FGD, additional two sub FGDs were conducted with women and youth separately. The structured discussions revealed commonalities as well as nuanced differences of how implications of climate change affect different communities, men, women and men.

KIIs were conducted with Director of Women's Bureau of Sri Lanka - Ms. Champa Upasena; Deputy Director of the Ministry of Agriculture - Mr. P.N.N. Jayanetti.

Limitations

²⁵⁷ <https://www.adb.org/sites/default/files/publication/178615/sea-economics-global-climate-stabilization.pdf>

²⁵⁸ https://www.germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202019_2.pdf

²⁵⁹ https://docs.wfp.org/api/documents/WFP-0000124690/download/?_ga=2.60147886.202029517.1645446172-70728959.1645446172

Inadequate availability of district-specific secondary data for the desk research was a key limitation. General unawareness and unfamiliarity on climate change and climate adaptation among community groups resulted in FGDs taking more time to complete than anticipated.

Fuel shortages, power cuts amidst general uproar during the economic crisis posed considerable challenges in convening community members in the month of April.

Delays in getting KIIs scheduled and subsequent limited availability of key Government officials, especially from the Climate Change Secretariat impacted the number of KIIs completed for the assessment.

C.3 Context and literature

Socio-economic Implications of Climate Change

The economy of Sri Lanka is dominated by the service sector (61.7% of Gross Domestic Product [GDP] as of 2017), with major contributions from trade, transportation, and real estate activities. While the agricultural sector has shrunk in its contribution to GDP (7.8% as of 2017), it remains a significant employer (27% of the labor force as of 2016). Approximately a quarter of Sri Lanka’s population are believed to live within the metropolitan area of its commercial capital, Colombo. However, official statistics suggest Sri Lanka’s urban population is relatively low, reportedly 19.3% in 2016.²⁶⁰

While extreme weather events cause the highest direct losses and damages, slow onset impacts such as droughts, saline intrusion, or soil depletion affect larger numbers of people over extended periods of time. According to data published by the United Nations Office for Disaster Risk Reduction (UNDRR) in 2019, temperature increase and changing precipitation patterns can trigger dry spells and prolonged droughts such as the ones that hit Sri Lanka in 2015/16 and 2016/17. This threatens agricultural livelihoods across Sri Lanka and imperils large segments of the rural population. With increasing environmental and economic pressure, many small-scale agricultural operators find themselves left with few alternative employment and income options. Depending on their household characteristics, they can find themselves in a "poverty trap" without a way out.²⁶¹

The rural economy almost entirely depends on climate-sensitive crop cultivation, and the cumulative impacts of climate change put an additional strain on this system. As an ad-hoc coping strategy, smallholder farmers migrate towards urban centers in search of alternative income sources. In Sri Lanka’s dry zone, many families already live on the verge of multidimensional poverty or have to pay off loans for seeds and equipment. Climate change can render small-scale agriculture, home gardening, tank fisheries, and other rural income sources unprofitable, forcing them to either find alternative employment, fall into poverty, or move away. (IOM 2016).²⁶²

Sri Lanka’s rural economy is dependent on the cultivation of climate-sensitive crops to a large extent. The lack of structured and planned coping strategies along with climate-risk mitigation systems has resulted in men and women, primarily seeking jobs in cities as labourers, apparel workers in non-agricultural income generation sectors. This has led to a phenomenon of rural-urban migration. In most cases it is the men who migrate to cities leaving women, children and older persons at home in their villages. This has many ramifications where family members face vulnerabilities related to further economic deterioration, engagement in precarious work conditions and prone to forms of abuse and discrimination.²⁶³

The assessment aims at understanding implications of climate change to agricultural populations in six targeted districts - Mannar, Vavuniya, Mullaithivu, Trincomalee, Kurunegala and Monaragala. As per the Agricultural Household Survey conducted by the Department of Census and Statistics in 2017, Kurunegala marking the highest number, the Agricultural population (Age 15 and above) in the targeted districts are as follows:

District	Agricultural Population (age 15 and above)
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²⁶⁰ CBSL (2018). Economics and social statistics of Sri Lanka 2018. Central Bank of Sri Lanka. URL: <https://www.cbsl.gov.lk/en/publications/other-publications/statistical-publications/economic-and-social-statistics-of-sri-lanka>

²⁶¹ <https://reliefweb.int/sites/reliefweb.int/files/resources/Policy%20Brief%20Climate%20Change%20and%20Human%20Mobility%20in%20Sri%20Lanka.pdf>

²⁶² Ibid

²⁶³ <https://www.slycantrust.org/theme-knowledge/climate-risk-and-disaster-risk-management>

Mannar	24,424
Vavuniya	68,029
Mullaitheevu	59,439
Trincomalee	78,463
Kurunegala	802,962
Monaragala	261,817

Table 1 - Agricultural population (Age 15 and above)²⁶⁴

C.4 Gendered Implications of Climate Change

Approximately, over 29.7% of the total number of employed women in the country work in agriculture — a sector that is extremely vulnerable to the climate crisis — where most of that population engage in subsistence agriculture. In comparison, most of the male population that engages in agriculture often engage in high-value, large- volume crop types such as paddy; this only further highlights women’s vulnerability to climate shocks. Moreover, the absence of the quantification of women’s contribution to agriculture, and value chains and the lack of data surrounding women’s participation in agriculture further advances their inequalities while also making it difficult to address their, often gendered, issues.²⁶⁵

In accordance with the Agricultural Household Survey conducted by the Department of Census and Statistics in 2017, the number and percentage of female agriculture operators in targeted districts of the assessment are given below:

District	Number of female agricultural operators	%
Mannar	1916	21
Vavuniya	6524	26
Mullaitheevu	3517	16
Trincomalee	6570	20
Kurunegala	72202	25
Monaragala	20968	20

Table 2 -Number and Percentage of Female Agricultural Operators

Women are disproportionately at the risk of the effects of climate change and are one of the most vulnerable demographics in Sri Lanka. The livelihoods and the resources they depend on the most are imperiled. This is even more critical for rural women engaged in the agricultural sector because their food security and livelihoods rely on the productivity of their land. When other intersecting facets such as class, race, sexuality and disability are coupled with the minimal control women have in the economic, political and legal spheres, their exposure to climate shocks is further heightened.²⁶⁶

²⁶⁴ <http://www.statistics.gov.lk/Resource/en/Agriculture/Publications/AHS2016-17Report.pdf>

²⁶⁵ Gender and Climate Change Policy Brief. United Nations Development Program, 2020.

²⁶⁶ Ibid

As rain falls only three to five months of the year in the Dry Zone, at a household level women have an imperative role in the management of water and often cover long distances by foot to collect water for drinking, washing and bathing. Women are members of farmer's societies for the maintenance of reservoirs and distribution of irrigation water. However, they are not in decision-making roles hence water allocation decisions and crop selection are largely male dominated.²⁶⁷

According to the Food and Agriculture Organization (FAO), being a woman in a rural setting only aggravates the limitations that subsistence farmers face due to the climate crisis, as women have historically lacked access to productive resources including the basic agri- resources that men have access to. The gender parity when it comes to decision making, political participation and ownership of resources, is drastic. Therefore, diversifying agricultural livelihoods, establishing other off-farm income sources, and raising the resilience of rural women by increasing their economic participation and contribution to household income thereby growing their access to and control over economic assets and decision-making is paramount to sustainable climate action.²⁶⁸

Women traditionally manage household water, family gardens and livestock and are in the frontline of managing impacts of reduced water availability and disaster impacts. This affects their own intra-household food security, which can be exacerbated during extreme climate events and in the aftermath of a disaster.

According to the Sri Lanka Time Use Survey conducted in 2017 by the Department of Census and Statistics, the overall participation rate for unpaid domestic services related activities for men and women are 54% and 86.4% respectively.²⁶⁹ Women take full responsibility for the care of children, persons living with a disability, and the elderly. In the Dry Zone districts of Sri Lanka, the impact of war and disease has left a number of women widowed resulting in a significant number of female-headed households. War further increased women's care responsibilities to those living with a disability. It has also resulted in pushing other women into precarious work, in Sri Lanka and overseas, as domestic migrant labour. Participation and decision-making about livelihoods support systems is not always accessible.²⁷⁰

Due to barriers for women attempting to access the urban labour market and sociocultural preconceptions and traditions, there is a strong gender component when it comes to climate-related migration in Sri Lanka. The majority of internal economic migrants are adult males while women, children, those with special needs, and the elderly stay behind in rural areas.²⁷¹

In the rural agricultural landscape, access and ownership of resources like credit, land, and technology, the lack of women in managerial positions, and in development planning posit the crux of the gender inequality and inequity issues. The impacts of such inequalities and women's socio-economic disadvantages continue to undermine the sustainability of climate change responses. Therefore, to ensure that rural women can better withstand and respond to climate change and resultant crises, empowering them to be economically active is essential to adaptation work.

Given this background, women's livelihoods, and their interlinkages with the climate crisis exacerbate existing gender inequalities, poverty, and food insecurity. The impacts of climate change on agriculture, especially in the Sri Lankan context, are now substantial and evident — turbulence in rainfall patterns, increased frequency and intensity of extreme weather events, and extended periods of drought and other weather anomalies. In such conditions, the status of rain-fed smallholder farmers is particularly vulnerable; the small size of the farms, low levels of technology, low capitalization, and other non-climate stressors pave the way for low agricultural productivity, thereby inflicting serious effects on income, food security, nutrition and wellbeing.²⁷²

Lack of education and awareness on climate change increases a farmer woman's vulnerability when natural disasters take place - as their responsibilities of taking care of children and the elderly intensify. As noted previously, withdrawal from agriculture and rural-urban migration is a stark consequence of climate change on men due to inconsistent patterns of rainfall, crop failure and ultimate loss of income.

²⁶⁷<http://www.adb.org/sites/default/files/institutional-document/172710/sri-lanka-country-gender-assessment-update.pdf>

²⁶⁸ <https://www.fao.org/3/CA1516EN/ca1516en.pdf>

²⁶⁹ http://www.statistics.gov.lk/PressReleases/TUS_FinalReport_2017

²⁷⁰<https://www.adb.org/sites/default/files/institutional-document/172710/sri-lanka-country-gender-assessment-update.pdf>

²⁷¹<https://reliefweb.int/sites/reliefweb.int/files/resources/Policy%20Brief%20Climate%20Change%20and%20Human%20Mobility%20in%20Sri%20Lanka.pdf>

²⁷² <https://www.pnas.org/content/pnas/104/50/19680.full.pdf>

This invariably leads to women working for longer hours to support their families and husbands while attending to household responsibilities.²⁷³

C.5 Implications of climate change on children and youth

Children, girls and boys are part of vulnerable groups; there are many child-headed, child-supported (children engaged in livelihood activities as parents are either dead or severely disabled) households due to conflict as well as CKDu. Further, in Sri Lanka, after age 16, the percentage of children attending school drops significantly, this is visible especially in CKDu affected areas. According to the MDG Country Report 2014, the percentage of children attending school after the age of 16 is as follows; Anuradhapura and Puttalam (48.9%), Mullaitivu (47.5%) and Mannar (48%). It should also be noted that a significant number of boys drop out of school at an early stage to work as labourers in farms. Girls' education is also affected as they are mostly burdened with increased household chores, including collection of water from distance such as looking after younger siblings, cooking, taking care of elderly and sick etc.²⁷⁴

Research has shown that women and men face different vulnerabilities, risks, and impacts based on their gender, with implications for their coping strategies and overall well-being. In many societies, women and girls bear the brunt of household chores in addition to caring for children and the elderly, household food production, water and wood gathering. Many of these inequalities can increase vulnerabilities to climate shocks, given many women and girls may lack appropriate access to disaster information, to financial services, to participation in community decision-making and resource allocation, and to rights that govern property and mobility.²⁷⁵

Labour migration of men has a notable increase in a woman's care burden of household responsibilities, childcare and agricultural work. Oftentimes women are pressured to find additional sources of income further to farming. Increasing levels of poverty among agricultural communities due to reducing income imputable to slow onset climatic conditions and natural disasters cause substantial damage to children and youth. As reported by the International Labour Organization in 2018, this leads to abuse, neglect, disruption of education and even child labour.²⁷⁶

Scarcity of water poses a significant threat to children, especially girls. Research indicates that over 33% of school children in Sri Lanka do not have access to safe sanitation facilities due to lack of water availability. Most schools in the dry zone do not have toilets or functioning toilets with a supply of water due to reduced or the lack of water availability in the area. This has resulted in absenteeism during menstruation and illnesses among students and teachers.²⁷⁷

As per the Agricultural Household Survey conducted by the Department of Census and Statistics in 2017, the percentage distribution of agricultural household population by age groups within the targeted districts are as follows:

District	Age 0-9	Age 10-19	Age 20-29
Mannar	12	23	17
Vavuniya	14	21	13
Mullaithivu	15	22	16
Trincomalee	15	21	11
Kurunegala	13	14	12

²⁷³ <https://www.weforum.org/agenda/2020/03/women-climate-crisis-vulnerability-empowerment/>

²⁷⁴ <https://www.greenclimate.fund/sites/default/files/document/gender-assessment-fp016-undp-sri-lanka.pdf>

²⁷⁵ https://docs.wfp.org/api/documents/WFP-0000124690/download/?_ga=2.60147886.202029517.1645446172-70728959.1645446172

²⁷⁶ <https://reliefweb.int/sites/reliefweb.int/files/resources/Policy%20Brief%20Climate%20Change%20and%20Human%20Mobility%20in%20Sri%20Lanka.pdf>

²⁷⁷ <http://www.irinnews.org/report/99017/sri-lankan-schoolchildren-miss-out-on-sanitation-gains>

Monaragala	15	17	13
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Table 3: Percentage distribution of Agricultural Household Population by Age group

Statistics indicate that Mannar overall has the highest percentage of children and youth. In comparison with Table 01 (number of agricultural households per district), Mannar records the lowest number of agricultural households among targeted districts in the assessment.

According to a national perception study conducted in 2021, while engaging in climate action, some main obstacles faced by Sri Lankan youth are:

- Lack of awareness of institutions and their processes
- Lack of access to government decision-making and international processes
- Lack of technical knowledge and capacity
- Limited availability of resources and funding, especially reliable long-term funding
- Lack of youth inclusion in policies and plans, including the Nationally Determined Contribution (NDC) and National Adaptation Plan (NAP) process
- Lack of availability of climate information and gaps in knowledge dissemination
- Unavailability of knowledge products in local language and with local context
- Adverse impacts of climate change to their communities, families, livelihoods, health, education, and development, specifically for youth from rural, poor, or vulnerable communities.

²⁷⁸

According to a survey conducted by UNICEF in 2021, 66% of respondents in Sri Lanka reported that they were not able to explain climate change and global warming, a number that was slightly higher than the regional average (64%). Younger female respondents (15-19) were the group least likely to be able to explain climate change. The majority of respondents stated that they learn about climate change in Geography class (67%) and Science class (18%), however only 48% of respondents reported that they “very often or often” learned about climate change in school. This figure was lower than the regional response (65%) and the lowest out of the eight countries surveyed.

These figures suggest an opportunity to focus on inclusion of climate change in the curriculum, teacher training and learning materials and pedagogical approaches in formal, non-formal and informal education. The survey report further recommends that climate change should be treated as a multi-disciplinary topic to the extent possible in the national curriculum and linked to new and emerging industries and sectors advancing low-carbon pathways in Sri Lanka. ²⁷⁹

C.6 Common context relevant climate vulnerabilities of farming communities

Agricultural communities require regular information on fertilizer use, new seed varieties, pest control, compost, access to credit, crop sales etc. According to the Agricultural Household Survey of 2017, 55% of farmers gain access to this information via government officers and service providers. 15% of farmers access aforementioned information via farmer societies while 13% access information through other farmers; 10% via private companies and 2% via NGOs in the area.

Rain falls only three to five months of the year in the Dry Zone - women, who traditionally have a crucial responsibility of getting water to their households, have to walk long distances by foot to collect water for drinking, washing and bathing. Women are members of farmer’s societies for the maintenance of reservoirs and distribution of irrigation water; however they are not in decision-making roles hence water allocation decisions and crop selection are largely male dominated. ²⁸⁰

Key challenges faced by agricultural households include climatic issues, financial constraints, lack of proper pricing for produce, lack of storage facilities, inaccessibility to technology. Out of the key challenges, most households noted that drought and irregular rains was the main challenge. A total of 43% of households noted that drought and irregular rainfall was the main challenge they faced in the Yala cultivation season, while 52% responded to the same regarding the Maha cultivation season. ²⁸¹

²⁷⁸ https://www.britishcouncil.lk/sites/default/files/sri_lanka_country_report.pdf

²⁷⁹ <https://www.unicef.org/rosa/media/14946/file/Rising%20to%20the%20Challenge%20-%20Sri%20Lanka.pdf>

²⁸⁰ <https://www.greenclimate.fund/sites/default/files/document/gender-assessment-fp016-undp-sri-lanka.pdf>

²⁸¹ <http://www.statistics.gov.lk/Resource/en/Agriculture/Publications/AHS2016-17Report.pdf>

The Government of Sri Lanka's Climate Change Policy acknowledges that by increasing opportunities for women, a diversified role for women in agricultural activities expands, thereby promoting opportunities for women's entrepreneurship and transformational change.²⁸²

The Nationally Determined Contribution (NDC) updated in 2021 by the Ministry of Environment explicitly states that, to ensure adaptation, the NDC should enable access to benefits. Thus the sector will need to invest in gender-responsive training, promote more entrepreneurial skills among women and provide access to technology and finance that supports their participation. A more gender-responsive NDC will enable men and women to equally benefit from new technologies, climate-smart production and water management practices that would include better agriculture productivity, food security and incomes, greater resource management efficiency (water, land, food processing and preservation) etc.²⁸³

C.7 Ground Level Evidence and Findings

Level of Awareness

Climate change has a more direct and severe impact on agri-based livelihoods such as paddy cultivation, fisheries, vegetable farming, poultry and dairy farming. There was an evident lack of awareness on climate change, climate adaptation and climate risk mitigation among all communities. For most communities, the FGDs was the first time where they engaged in any form of discourse related to climate change.

The general understanding of climate-induced disasters was more skewed towards post-disaster responses of extreme weather events such as floods and landslides. There was a clear artificial dichotomy in how implications of slow onset climatic changes (temperature increases, changes in rainfall patterns) and extreme weather events were perceived. There was a higher tendency to identify the latter as adverse effects of climate change rather than the former. During the collection of primary data, it was made evident that the aforementioned disconnection between slow onset climatic conditions and natural hazards were embedded in the viewpoints of KII conducted with the MWCD.

Access to information plays a huge role in obtaining any form of awareness on climatic conditions - this is where language plays a significant role. An ethnic division in information dissemination related to climate change and adaptation comes into play when it is not developed and shared in local languages (Sinhala and Tamil). This includes printed material distributed by government extension services, private organizations, NGOs and field officers.

As per the KIIs and FGDs it was made evident that language (through that, ethnicity) is an intersectional barrier that is more to the forefront than gender in the aspect of accessing information and information sharing.

Most community groups received information via government extension services, however discussions around sharing information related to practical climate mitigation tactics were shared among small village groups. This was evident in Vavuniya and Monaragala where women groups played a substantial role in sharing information on how to mitigate risks due to climatic conditions. For example, sharing climate-resistant indigenous seeds – this entailed having practical knowledge on controlling high temperature of livestock.

The Ministry of Agriculture also noted a gap in awareness and technical knowledge among agricultural service providers when it comes to climate adaptation and climate risk mitigation. The lack of designated officers with capacity on climate adaptation and mitigation is a significant void for communities to access timely and accurate information.

C.8 General Implications

Increase in temperature, changes in rainfall patterns, scarcity of water, changes in water quality are the main slow onset effects of climate change which were brought up during discussion. These changes have had a direct impact on different stages in cultivation practices from sowing, harvesting, marketing and overall reductions in yield and income.

These scenarios of reduction of yield and income due to temperature increases, scarcity of water, inconsistent rainfall patterns have led to agriculture-related livelihoods being perceived as loss making areas of work. The discussions outlined several key ramifications which were evident in all 5 districts:

²⁸² http://www.climatechange.lk/CCS%20Policy/Climate_Change_Policy_English.pdf

²⁸³ <http://www.climatechange.lk/CCS2021/UpdatedNDCsSriLanka2021.pdf>

- Unwillingness of youth to engage in agri-based livelihoods as it is perceived as a loss making, degenerative, non-progressive way to make a living.
- Climate induced migration - men and youth moving out of agriculture to cities and urban areas in search of employment opportunities, often as daily paid laborers.
- Women who stay back in their villages after their husbands migrate to cities in search of employment have a higher care burden and economic burden to bear.
- Increase in women moving from agricultural work to migrant work, this was most common in Kurunegala and Vavuniya.
- Due to reduction in yield and income, agricultural workers have sought to obtain loans from unregulated financial service providers such as micro credit companies and got entrapped in serious debt traps. The discussions revealed that women were more often coerced by their husbands to apply for these loans.

The discussions outlined an interconnection between increase in temperature and scarcity of water. Its implications are inter-connected. Participants explicitly mentioned that water sources such as reservoirs in their villages are drying. Some key implications of water scarcity as per the discussions are:

- Overall crop failures, reduction in yield, inability for plant saplings to develop a strong root system, stunted growth of plants.
- Increase in salinity in water (sodium and calcium) - this has resulted in villagers not being able to consume water even from their home wells. Furthermore, in districts where water with high salinity is present such as Vavuniya and Monaragala, the district secretariat has introduced a mechanism to sell water for 2 LKR per liter.
- Increase in temperature affects poultry and dairy farming with the risk of animals succumbing to heat strokes and or diseases.
- Drying up of water sources has led to elephants moving from forest areas to villages towards houses. This has imposed a serious risk of human elephant conflict in Mannar and Trincomalee.
- Increase in temperature and drying up of water resources impacts inland fisheries in Trincomalee, Vavuniya, and Mannar in stages of fish spawning, hatching of fish eggs and the size of the fish.

C.9 Climate adaptation and Climate risk mitigation

To reiterate, there was a significant lack of awareness and general understanding on climate change, adaptation and risk mitigation. However, when probed on certain action steps taken to minimize adverse effects of climatic changes, the discussions brought out several pragmatic courses of action:

- Poultry - Poultry farmers spray water on their chicken a few times a day to relieve their livestock from the heat.
- Inland fisher communities use different nets during drought seasons to avoid small fish being caught.
- Sprinkler systems, water pumps and tube wells are constructed by one's own financial resources or with assistance from the Agrarian Services Department.
- Farmers in Monaragala have switched to cultivating non-hybrid, indigenous seed varieties which have proven to be more climate resistant.

There was no significant understanding on how climate financing can contribute to minimizing the adverse effects of climate-induced disasters and subsequent loss. Participants were skeptical about crop insurance due to lack of confidence, evident delays and general ambiguity surrounding crop insurance as it is a State-driven mechanism.

In terms of climate change mitigation, the MWCD provided more emphasis on post-disaster response. The importance of providing mental health support through counseling services at a time of a natural disaster was emphasized during KIIs. Post disaster response is a key way through which the MWCD engages in work related to the implications of climate change.

The KII conducted with the Ministry of Agriculture outlined key climate adaptation strategies/tools introduced to rural farming communities, which are: micro irrigation systems, solar powered micro irrigation systems, promotion of value addition for agricultural produce.

C.10 Gendered Implications

Intersections of gender inequality and climate change in the agriculture sector in Sri Lanka primarily fall within the parameters of who is considered a farmer. The discussions revealed that the lack of land ownership has prevented women from getting access to certain services which could potentially increase her level of disaster preparedness:

- Agrarian Services, Farmer Societies only acknowledge someone as a farmer if they own land. With the lack of land ownership faced by women, they do not get access to government support in receiving sprinkler systems/motors for free or discounted prices, technical knowledge on climate adaptation, financial services to incorporate climate adaptation tools to their cultivation practices. Discussions outlined that its primarily women who undertake responsibility in watering crops, giving water to livestock or securing drinking water in their homes. Scarcity of water has often resulted in women having to spend more time and resources to reach water sources. This has had a direct impact on how her time is distributed among other responsibilities in the household and field.
- Slow onset climatic changes have had more impact on agricultural sectors, practices and stages in cultivation which women get involved in thereby imposing more livelihood-related challenges which are often more time-consuming and costly.
- It is often women who undertake the responsibilities of feeding and taking care of livestock in poultry and dairy farming. With increased temperatures, they are required to give them water more frequently than usual.
- Increased salinity in water affects vegetable cultivation and home gardening - these are livelihoods with a higher engagement of women. Changes in water requirements to crops and loss of yield due to higher temperatures have a direct impact on their times spent in the fields and changes in income.

The increase in men moving out of agricultural work in search of work opportunities in urban areas has increased a woman's care burden and economic burden. Discussions in Trincomalee and Mannar revealed that women have sought to engage in additional income generation activities such as working as caretakers, cleaners, food distributors in addition to working in the fields.

When there is loss and crop damage faced due to climatic changes (high temperatures, drought, floods), women obtain microfinance loans to manage their household expenses. This has resulted in women getting caught in debilitating debt traps.

It was learnt that women farmers and women as primary producers in value chains tend to be more vulnerable to climate change. The KII with MWCD emphasized on direct and indirect gendered implications of climate change - Direct implications - women who solely depend on farming and fishing as agricultural workers and farmers; Indirect implications - women entrepreneurs who engage in agri-based livelihoods/small industries.

The interview done with the Ministry of Agriculture did not outline or distinguish a gendered division in how communities experience climate change. The feedback received for the KII primarily affirmed that climate change is felt by both men and women equally.

C.11 Best Practices

Monaragala - Conservation of indigenous seeds and setting up seed banks: Although left largely unrecognized, women farmers continue to be custodians of indigenous seed varieties and traditional farming practices across the globe. Despite numerous barriers imposed at multiple levels, from their own communities to multinational companies, women farmers have continued to show resilience in fortifying local food systems - conserving indigenous seed varieties is one such commitment women have continued to honor for generations.

Undeterred by propaganda by big corporations to promote hybrid seed varieties which increase dependency of farmers and are not adaptable to climate change - a group of women farmers from Monaragala in Sri Lanka have been successfully working towards conserving indigenous seed varieties since the 1980s.

Uva-Wellassa Womens' Organization (UWWO) started their efforts in the conservation and distribution of heirloom seed varieties first with a group of 20 women farmers who identified that there was a scarcity in good seed varieties in their area. At its very inception, the women had exchanged seeds during monthly committee meetings which over the years have expanded and grown to the establishment of 05 seed banks in Monaragala with a secure membership base of over 100 women farmers to date.

Research indicates that over 75% of crop diversity in the food that we eat has been lost between the 1990s - 2000s (FAO, 2010). The promotion of hybrid, genetically modified seed varieties by multinational corporations have systematically increased dependency of small and medium scale farmers resulting in an overall increase in the use of agrochemicals, rise in non-communicable diseases and debt.

"We wanted women to take a more active role in agriculture. At the beginning we started giving indigenous seed varieties of long beans and okra for free during our monthly meetings. Subsequently we encourage women to exchange seeds among each other. Soon after we started a small seed repository - a rack with seed varieties securely stored in clay pots, this was in the early 1990. This eventually grew up to five fully functional seed banks" stated K.P. Somalatha, a founding member of this seed conservation movement.

The UWWO seed banks have established continuous seed exchange channels from Monaragala to Ampara, Vavuniya, Batticaloa and Anuradhapura.

The UWWO continues to work towards a vision of sustaining traditional farming practices that are environmentally sustainable and led by women. As founding members further relate their experiences, it was revealed how it was hard for women to take over leadership and decision making roles amidst the rigid patriarchal system in farming communities. Two strategic approaches have been deployed towards creating a positive transformation in bringing women farmers to the forefront of agriculture in Monaragala:

- 1) Instill technical expertise among women farmers: Increased technical capacity on environmentally friendly farming have allowed women to be agents of change in convincing their own families to adopt better farming practices. The more women were seen as bearers of knowledge and expertise, the more they were allowed to get involved in decisions-making.
- 2) Create opportunities for economic engagement and income generation: create market linkages and access to markets for women farmers and provide opportunities to move up the value chain.

What started off as a seed conservation initiative and gradually evolved into a seed conservation movement, later incorporated a business model which organized women farmers into producer groups and linked them with markets. A part of this vision also included advancing women farmers up the value chain, beyond occupying the role of being primary producers. Organic certification methods were introduced where members produced certified chemical-free fruits, vegetables and greens via the Participatory Guarantee System (PGS).

Women farmers have been able to take on an entrepreneurial role with this value addition - their current consumer base has surpassed regular farmers' markets in the Uva Province. Keeping abreast with new technology, UWWO now undertakes orders for organic vegetables and fruits via Facebook and email on behalf of its women farmer members. Since then, producer groups of women farmers from Monaragala have been able to reach a wider consumer base and respond to the increasing demand for organic fresh produce.

The establishment of this women-led seed conservation mechanism in Monaragala has created spaces of power and recognition for women farmers in their communities in a multitude of ways - reaping positive outcomes economically, culturally and environmentally. Key positive impacts are:

- Fostering intercultural solidarity: The seed banks run by UWWO actively engages in sharing seeds with farmer groups around the country. The exchange of seeds also enables an exchange of traditional knowledge from farmer groups across different regions, enhances crop diversity and strengthens solidarity among farmers of different ethnicities.
- Supporting climate resilience: Indigenous seed varieties are more climate resilient requiring comparatively less water and being more resistant to pest attacks. The cultivation of heirloom seeds is a proven successful climate adaptation mechanism and makes farmers less vulnerable to climate change and its adverse effects.

- Strengthening women's leadership: capacity enhancement of technical knowledge and creation of opportunities for economic engagement and increased income have contributed to women farmers being perceived as leaders, experts and entrepreneurs. This recognition and level of acceptance has been able to disrupt patriarchal social norms in the agricultural sector and paved the way for women farmers to lead decision making processes related to the cultivation and harvesting of their crops.
- Promoting sustainable farming practices: These producer groups of women farmers are not only committed to safeguard heirloom seed varieties, but they also serve to demonstrate that the cultivation of indigenous seeds produces a higher yield with minimum agricultural inputs. These women farmers from Monaragala continue to be active advocates of the economic and environmental benefits of sustainable farming practices.
- Creating access to new markets: UWWO now connects women farmers with consumers via Facebook and email. This not only enables socially conscious consumers to directly link with women farmers but it also facilitates a wider market reach. The women farmer groups also have set up selling points/physical market spaces at the UWWO office premises and selected public places within the Uva province and Colombo. Obtaining organic certification to their produce has increased their potential and ability to reach wider markets.

C.12 Key Recommendations

1. The evident dearth of knowledge and awareness on climate change and climate adaptation should be addressed. Simplified, comprehensive information must be shared with farming communities.
2. The introduction of climate adaptation tools, technology, innovation which are low-cost and practical would minimize the level of loss made in agricultural livelihoods due to climate changes. Invariably this can contribute to a reduction in men, women and youth moving out of agriculture.
3. A public and policy discourse around climate change and climate adaptation should be built with rural farming communities, farmer women, Agrarian Services departments and other stakeholders who closely function at village levels to create a conducive environment for information exchange and technical skills sharing.
4. Climate friendly tools should be introduced to targeted processes and stages in production with a higher involvement of women. This would create the space for women to lead climate solutions.
5. Inculcating an active involvement of children and youth being agents of information regarding climate change and climate adaptation would minimize youth moving out of agro-based industries and reshape future farming practices to be more sustainable and climate-resistant.
6. Build capacity of women farmers and female agriculture groups and create conducive environments for them to undertake seed conservation, transfer of traditional knowledge related to environmentally sustainable agriculture practices, and collective action through cooperatives and markets.
7. Support policy and practice leading to increasing women farmers access and control over resources and decision making power concerning access to land, financial services, markets, technology, redistribution of care work for women to lead a climate resilient transformation of food systems
8. Promoting women's leadership in farmer and fisheries societies at village and DS level.
9. Introducing agroecological cultivation and farming practices for different sectors and stages of food production with Agrarian Services Department, farmer and fisheries societies.
10. Ensure capacity development of agricultural officers specifically related to technical knowledge on climate adaptation and climate risk mitigation.
11. Reform the conditions of providing agricultural extension services where land ownership is a prerequisite to get eligibility for support services offered by the government.
12. Create programs and enforce support from agriculture extension services to increase capacity of a woman farmer's entrepreneurial skills.

13. Initiate campaign on portraying women farmers as leaders, entrepreneurs and decision makers among farmer communities, stakeholders in market systems and potential buyers. Create low-interest loan schemes with longer repayment periods specifically targeting women-farmers.
14. Equal participation of women farmers to be prescribed as a mandatory requirement for all technical knowledge and skill training programs.
15. Sensitize farmer communities and agriculture instructors on engaging with social norms on male-tasks and female-tasks.
16. Introduction of user-friendly technological schemes for women farmers.
17. Establish policy dialogues among government stakeholders and development agencies to promote recognizing and redistribution of care work among farmer women.
18. Establish mechanisms to disseminate and update information to women farmers on market systems, market demands, production and retail opportunities. This too can be done via extension services, agriculture officers and farmer cooperatives.

D. Regional high-level summary of full Gender Assessment.

The full Gender Assessments conducted in both India and Sri Lanka during full proposal development have validated and deepened the findings and recommendations of the Initial Gender Analysis conducted for the Concept Note process. They confirm that women in the dryland project localities in both countries face differentiated climate risks and have increased and different adaptation needs from men. While all recommendations made in the different gender analyses have been considered and many have been integrated into the project logic, synthesised priority recommendations that are relevant to the project localities in both countries are the following:

- **Address lack of knowledge and awareness and introduce/support low-cost practical adaptation tools and technologies, differentiated according to user needs:** The evident lack of knowledge and awareness on climate change and climate adaptation should be addressed. Simplified, comprehensive information must be shared with farming communities. The introduction of climate adaptation tools, technology, innovation which are low-cost and practical would minimize the level of loss made in agricultural livelihoods due to climate changes. Invariably this can contribute to a reduction in men, women and youth moving out of agriculture. Tools to promote climate resilience should be introduced to targeted processes and stages in production with a higher involvement of women. This would create the space for women to lead climate solutions.
- **Focus on five key dimensions to build women's agency for gender equality and to build resilience tackle escalating climate risks:** (i) strengthening women's decision-making capacity; (ii) facilitating collective actions; (iii) expanding institutional linkages; (iv) augmenting women's access to productive resources; and (v) reducing women's work burdens through appropriate farm machinery solutions.
- **Promote sustainable farming practices building on existing examples from women's groups:** for example, the women farmers from Monaragala producer groups who are not only committed to safeguarding heirloom seed varieties, but also serve to demonstrate that the cultivation of indigenous seeds produces a higher yield with minimum agricultural inputs. These women farmers from Monaragala continue to be active advocates of the economic and environmental benefits of sustainable farming practices.
- **Enhance access to climate-resilient and diversified employment opportunities:** especially for women across the study sites who noted this was important to reduce the growing risks inherent in farming. Building climate-resilient and nutrient dense value chains and facilitating market linkages along the value chain is a priority, with risk mitigating measures introduced in different phases of the value chain and enhanced capacities to act in the higher levels of value chain. Value chain activities can be linked with group formation and farmer collectives.
- **Develop and scale out gender-sensitive last mile climate services:** Both women and men expressed demand for targeted agro-met advisories, developed and disseminated with community involvement, to help them be more responsive and adapt to seasonal changes. Activities must be designed to overcome the fact that women have considerably less access than men to critical

information on weather alerts and cropping patterns, affecting their capacity to respond effectively to climate variability.

- **Ensure equitable participation of women and vulnerable groups in adaptation planning:** To promote empowerment and agency, as well as lead to more appropriate and sustainable adaptation implementation, the project should ensure that women and vulnerable groups, including youth, the elderly, woman-headed households and people with disabilities, are empowered and facilitated to participate equitably in the community-based adaptation planning processes, and equitably supported to implement their identified adaptation solutions. This can be extended to supporting women and youth to be effective change agents on climate-resilient livelihoods.
- **Integrate labour-saving approaches:** Women expressed strong demand for labour-saving approaches and machinery (such as milling machines) to reduce the drudgery in their daily lives and help them to add value to agricultural products and thus increase their incomes. This represents an opportunity for the project to make a significant difference to the lives of women, and thus their households. Specific ways to do this have been identified in different localities – for example, in Odisha and Ramanathapuram in Tamil Nadu, the drudgery of women in firewood collection can be reduced by increasing their capacity to access on an ongoing basis clean fuel through the relevant schemes.

Annex 2 Environmental and Social Screening, Impact Assessment and Environmental and Social Management Plan

This annex contains the following sections

1. Summary description of the project
2. Screening and Categorization of the project
3. Environmental and Social Management and Monitoring Plan

1. Summary description of the project

The project's main goal is to strengthen the climate change adaptive capacity and food security of vulnerable communities in Sri Lanka's dry zone and India's eastern coastal states, utilizing a regional, integrated approach. Leveraging differentiated skills and experience in the two countries, and using participatory and bottom-up approaches, the project will enable vulnerable groups to use last mile climate services to plan and implement targeted adaptation measures best suited for different livelihoods and localities, supplemented by livelihoods diversification and enhanced linkages to existing financial services. A regional feedback loop will provide valuable real-time lessons for scaling up and out, both within and beyond the two countries.

The project will achieve its goal through the following two objectives:

3. Strengthen access to reliable, timely and targeted last-mile climate services, and develop a system to co-produce, disseminate and scale up tailored agromet and hydromet advisories
4. Enhance the adaptive capacity of income-poor farming households facing high climate risks, with a focus on women and vulnerable groups, to develop and implement local adaptation plans informed by climate advisories, resulting in improved practices, and diversified, climate-resilient livelihoods

Potential activities for Component 2, as well as excluded activities, are listed in the following table.

	Potential activities	Excluded activities
SLM / land restoration	Contour ridges, swales, drainage channels , pits and half-moons to encourage infiltration Windbreaks Live fencing using multi-purpose trees (protection, soil fertility, forage, etc.) Area closure for rehabilitation Protection of streams, springs and spouts Assets for restoration of degraded watershed upstream of reservoirs: <ul style="list-style-type: none"> - Contour ridges/swales - Small earthen dikes - Silt trapping ponds on water inflow paths Small-scale re-forestation and woodlot development	Land expropriation Hillside terraces
Sustainable and climate-resilient agriculture	Good agricultural practices (GAPs) including integrated pest management	Introduction of agrochemicals Introduction of GMOs

	<p>(IPM), conservation tillage, organic farming</p> <p>Integrated farming systems (including small farm ponds)</p> <p>Homestead gardens (vegetables, fruit, fodder crops, wood trees)</p> <p>Climate-resilient and nutritious crops e.g. millets, pulses, etc</p> <p>Fruit trees (orchard) and other crop trees such as Moringa</p> <p>Support for gender-sensitive small livestock at HH level: poultry, small ruminants</p> <p>Seed and plant propagation of drought resistant varieties</p>	<p>Introduction of alien crop species</p> <p>Development of large livestock</p> <p>Large-scale monocultures (>2ha of contiguous land with 1 culture)</p>
Options to increase soil fertility	<p>Cover crops to improve soil health</p> <p>Using silt from reservoirs to improve soils</p> <p>Agroforestry, mulching, and compost making</p> <p>Microbial biofertilisers</p>	<p>Introduction of agrochemicals</p> <p>Introduction of GMOs</p>
Water conservation and irrigation (HH level)	<p>Rehabilitation of shallow hand-dug wells</p> <p>Rainwater harvesting e.g. from rooftops</p> <p>Micro-irrigation systems (including solar powered)</p> <p>Farm ponds for ducks and pisciculture</p>	<p>New water wells</p> <p>Boreholes</p> <p>Dams in rivers diverting >10% of surface flow OR >100m³ per day</p>
Rehabilitation of water infrastructure (community level)	<p>Micro and minor irrigation reservoir rehabilitation</p> <p>Rehabilitation of associated infrastructure</p> <p>Small irrigation schemes using surface water, diverting <10% of surface flow AND <100m³ per day</p>	<p>Water wells</p> <p>Boreholes</p> <p>Dams in rivers diverting >10% of surface flow OR >100m³ per day</p> <p>Rehabilitation or construction of dams with height>6m</p> <p>Community water ponds for irrigation/livestock use with volume>1,000m³</p>
Fish-farming as part of integrated farming system at HH level only	<p>Strengthening of traditional inland fisheries practices in semi-natural small farm ponds</p> <p>Restoration or creation of artificial fish ponds with depth<3m AND volume<1000m³</p> <p>Using local fish species</p>	<p>Creation of artificial fish ponds with depth>3m OR volume>1000m³</p> <p>Introduction of alien fish species in the ponds</p>
Options to reduce heat stress	<p>Multi-purpose trees for shade, fruit and fodder/other uses</p> <p>Poultry shelters</p> <p>Small livestock shelters</p>	<p>Construction of infrastructure with surface>30m²</p>

	Small water troughs for livestock	
Wildlife / human adaptation options	Technologies to reduce human-wildlife conflict e.g. bio-fencing, small-scale solar-powered fences, sound devices Shelter and foraging opportunities for wildlife	
Reduction of post-harvest loss and renewable energy	Trainings on post-harvest handling Trainings to strengthen the value chain Post-harvest storage facilities at HH and small farmer group level Post harvest technologies such as small milling machines Energy-saving stoves Solar dryers	Large storage facilities (>200m3)

Annex 9 contains additional information on compliance with national technical standards as they relate to all of the USPs in the Full Proposal. At this stage, the detailed information is only provided for India. It was not possible to gather this information in Sri Lanka at the time of finalisation of the FP due to the extremely challenging economic situation in Sri Lanka and the resultant impacts on all levels of society, including those of the Government departments. This detailed information will be gathered during the project inception phase and the additional details added to the ESMP where needed.

2. Screening and Categorization of the project

The project was screened against the 15 Environmental and Social Principles of the Adaptation Fund, using the screening tool presented below. This consists of a list of around 20 general Level 1 questions (indicated with two digits, e.g., 3.1) and around 60 detailed Level 2 questions (indicated with three digits, e.g., 3.1.1). They are categorized into 15 thematic areas that correspond with the 15 Environmental and Social Principles of the Adaptation Fund. The risk screening and assessment carried out complies with the 15 social and environmental principles of the AF as described in Part II.N.

All Level 1 questions need to be answered first. If a Level 1 question is answered with a 'yes', it leads to more detailed questions at Level 2. All Level 2 questions under a Level 1 question that triggered a 'yes' need to be answered. If a Level 1 question is answered with a 'no', then the corresponding Level 2 questions do not need to be answered.

Answers to the detailed Level 2 questions result in one of three degrees of concern. If any Level 2 question is answered with a 'yes', the indicated degree of concern will determine the degree of concern for the whole activity. This means that if a single question indicates a high degree of concern, the activity is classified as an activity of high concern and appropriate measures must be taken. If no question is answered with a high degree of concern, but at least one medium-level concern is raised, then the activity is a medium concern activity. If no Level 1 or Level 2 questions are answered with a 'yes', then the activity is of low concern and no further action is required.

It is possible that a Level 1 question is answered with a 'yes' and all associated Level 2 questions are answered 'no' as they are more detailed and specific questions of the same issue. If all the Level 2 questions are answered 'no', then this area will be of low concern, even if the Level 1 questions were answered with a 'yes'. There is no pre-determined degree of concern for Level 1 questions.

1. Compliance with the law				
	1.1 Is there a risk that the activity would not comply with an applicable domestic or international law?		NO	The project has been designed to be in compliance with the legal frameworks of Sri Lanka and India. Moreover, relevant national, departmental and district authorities have been consulted during the proposal development process and will be partners in the project implementation. This facilitates compliance with all relevant laws and regulations. An exhaustive list of laws and regulations the project must ensure compliance to is provided in Part II. K above.
	1.1.1 Is there a risk that the activity would not comply with an applicable international law?	High		
	1.1.2 Is there a risk that the activity would not comply with an applicable national or local law?	High		

2. Access and Equity				
	2.1 Could the activity lead to changes in local tenure arrangements for existing resources or resources created by the activity?		YES	Economic benefits from the project implementation could potentially put groups or individuals at a disadvantage or lead to disagreements and minor conflicts, including on land tenure arrangements.
	2.1.1 Could the activity lead to changes in tenure arrangements that potentially could put groups or individuals at a disadvantage or could lead to disagreements and conflicts?	Medium	NO	Project activities are not expected to lead to changes in tenure arrangements as such.
	2.2 Could the activity create or exacerbate intra- or inter-community conflicts?		YES	Economic benefits from the project implementation could potentially put groups or individuals at a disadvantage or lead to disagreements and minor conflicts.
	2.2.1 Could activities lead to opening up of existing or creating new minor conflicts or disagreements within or between groupings or communities?	Medium	YES	As above.
	2.2.2 Could activities lead to opening up of existing or creating new conflicts or disagreements within or between groupings or communities which potentially could become entrenched, violent, or spread to additional groups or communities?	High	NO	
	2.2.3 Could the activity bring unequal economic benefits to a limited subset of the target group?	Medium	NO	
	2.2.4 Could the activity lead to increased un-employment that would not be absorbed by other sectors or activities?	Medium	NO	
	2.3 Could the target beneficiaries or stakeholders be dissatisfied due to limited consultation during activity design or		NO	In-depth consultations were carried out at CN and FP stage and will continue throughout project implementation. An independent complaint

	implementation (including due to inadequate Complaints and Feedback Mechanisms)?			and feedback mechanism will serve the project and project beneficiaries and other stakeholders. Information on the mechanism will be widely disseminated so that stakeholder can easily access.
	2.3.1 Could the activity lead to dissatisfaction or negative impacts due to lack of beneficiary or other stakeholder participation in planning, design, implementation, or general decision making?	Medium		
	2.3.2 Is there a risk that not all relevant stakeholders, and especially marginalised or vulnerable groups, have been identified and consulted or that they have been exposed to internal or external pressure or coercion or not able to comprehend the consultations?	Medium		
	2.3.3 Could there be negative impacts due to an inadequate Complaints and Feedback Mechanism during project implementation?	Medium		

3. Marginalized and Vulnerable Groups				
	3.1 Could the activity impose disproportionate adverse impacts on marginalized and vulnerable groups?		NO	Marginalized and vulnerable groups – including women, youth, the elderly disabled people, different castes and particularly vulnerable tribal groups (PVTGs) - have been consulted during proposal development to ensure that their identified threats, priorities and concerns are duly reflected.
	3.1.1 Is there a likelihood that the activity would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalized or excluded individuals or groups?	Medium		
	3.1.2 Could the activity potentially restrict availability, quality of and access to resources or basic services, in particular to marginalized individuals or groups?	High		
	3.1.3 Could the activity aggravate the situation of vulnerable, marginalised, or otherwise disadvantaged individuals or groups?	High		
	3.2 Could the activity lead to influx of a temporary or permanent alien workforce?		NO	The project activities will not lead to influx of any alien workforce.
	3.2.1 Could the activity lead to influx of a temporary or permanent alien workforce of relatively small size in a relatively isolated or culturally sensitive community?	Medium		

	3.2.2 Could the activity lead to influx of a relatively large temporary or permanent major alien workforce (>10% of existing community) or a smaller group which could be expected to have important cultural, health, or socio-economic impact on a local community?	High		
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4. Human Rights				
	4.1. Could the activity fail to respect human rights?		NO	This project affirms the rights of all people and does not violate any pillar of human rights.
	4.1.1 Could the activity lead to violation of fundamental human rights as defined by international, national or local law?	High		
	4.1.2 Could the activity of partners, contractors, or suppliers, lead to violation of fundamental human rights as defined by international, national or local law?	High		

5. Gender Equality and Women's Empowerment				
	5.1 Could the activity lead to gender-based inequality, discrimination, exclusion, unwanted workload, or violence?		YES	Factors influencing the discrimination against women in terms of access to land and labour forced participation could pose some risks of women being excluded from the project's benefits in the long run.
	5.1.1 Could the activity create or amplify conditions for gender-based inequalities?	Medium	NO	The project will fully mainstream gender and will ensure that women and men and female and male youth equitably engage in and benefit from project activities. The project's gender mainstreaming strategy as set out in Part III.A is a central element of the exit strategy. A gender assessment has been conducted, and women and women's groups will be intensively consulted during further design in the inception stage and implementation of the project.
	5.1.2 Could the activity lead to gender-based violence?	High	NO	
	5.1.3 Could the activity lead to gender inequities in who makes decisions?	Medium	NO	
	5.1.4 Could the activity lead to increased unpaid work for women and girls?	Medium	NO	

6. Core Labour Rights				
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6.1 Could the activity fail to respect core labour rights?			NO	The IE and its partners respect international labour laws and codes, as stated in WFP's policies. WFP has a zero-tolerance policy for child labour of children below 14 years.
	6.1.1 Does the activity involve support for employment or livelihoods that may fail to comply with national and international labour standards (i.e., principles and standards of ILO fundamental conventions)?	High		
	6.1.2 Could the activity, or that of partners, contractors, or suppliers, involve use of child (<14y) or forced labour?	High		

7. Indigenous Peoples				
7.1 Does the activity involve indigenous peoples or could it affect indigenous peoples?			YES	The activities implemented in In Odisha, India, will include people from the particularly vulnerable tribal groups (PVTGs), while in Sri Lanka Veddha indigenous people present but are found mainly in forested areas in the south-central regions, and thus it is unlikely any of the project localities will include this group.
	7.1.1 Could the activity negatively affect indigenous peoples, culturally or otherwise, without their specific Free, Prior, Informed, Consent (FPIC)?	High	NO	A Free, Prior and Informed Consent (FPIC) process will be sought during the inception stage of the project, when specific localities will be identified. A relevant Indigenous Peoples Plan will be elaborated and implemented in coordination with the project activities. The project will not discriminate against any group and will ensure the widest participation from all different groups during all of its phases, from the design to the implementation.

8. Involuntary Resettlement				
8.1. Could the activity lead to resettlement?			NO	The project is not expected to lead to involuntary resettlement, neither in physical nor economic terms.
	8.1.1 Could the activity lead to involuntary economic or physical resettlement of households or individuals?	High		

9. Protection of Natural Habitats				
9.1 Could the activity lead to negative impacts on natural habitats?			NO	The project is not expected to impact negatively on any natural habitats. Rather, by implementing adaptation activities consistent with EbA, such as SLM and agroforestry, the project will ensure the protection of natural habitats. In addition, consultations with government stakeholders and communities will ensure that conversion or degradation of critical natural habitats (including those that are legally protected, officially proposed for protection, recognized for their high conservation value, or

				recognized as protected by traditional or indigenous local communities) is avoided.
	9.1.1 Could there be negative impacts on critical migration corridors of endangered or otherwise or important animal or insect species?	High		
	9.1.2 Could the activity lead to increase in unregulated or unlicensed collecting, hunting, or fishing?	Medium		
	9.1.3 Could a natural habitat be significantly degraded, fragmented, or more than half of extent destroyed?	Medium		
	9.1.4 Could a natural habitat be almost fully destroyed or degraded so that it no longer could function as natural habitat for the original fauna/flora?	High		
	9.2 Could the activity lead to negative impacts in protected or internationally recognised areas?		NO	The project does not foresee any activity in the proximity of protected or internationally recognized area. Project activities are not expected to lead to negative impacts to habitats.
	9.2.1 Will any major constructions be located close (<200m) to critical habitats, protected areas, or areas of particular or locally recognised ecological significance?	Medium		
	9.2.2 Could the activity lead to negative impacts on protected or internationally recognised areas?	High		

10. Conservation of Biological Diversity				
	10.1 Could the activity lead to negative impacts on biodiversity or endangered species?		YES	Some activities of Component 2, such as agroforestry and promotion of new crop varieties, could potentially have adverse impacts on biodiversity, leading to a deterioration of biological diversity if species are not correctly selected (e.g., inadvertent introduction of invasive species) and diversified.
	10.1.1 Could the activity lead to degradation of biodiversity or significant reduction in one or more common animal, insect, or plant species?	Medium	YES	As above.
	10.1.2 Could the activity lead to loss (eradication or removal from local area) of one or more animal, insect, or plant species?	High	NO	
	10.1.3 Could there be negative impact on any endangered or critically endangered animal, insect, or plant species?	High	NO	

	10.1.4 Could the activity lead to introduction of invasive alien varieties or species which could influence local genetic resources?	Medium	NO	
	10.1.5 Could the activity lead to introduction of invasive alien varieties or species which potentially could eradicate, change, or significantly reduce local naturally occurring varieties or species?	High	NO	
	10.1.6 Could the activity introduce genetically altered organisms?	Medium	NO	

11. Climate Change				
	11.1 Could the activity lead to increased exposure, increased vulnerability, or reduced resilience of beneficiaries to the effects of climate change?		NO	The entire project is designed to reduce beneficiaries' exposure and vulnerability to the effects of climate change and increase their resilience.
	11.1.1 Could the activities result in increased exposure to climate induced hazards?	High		
	11.1.2 Could the activity result in beneficiaries being more vulnerable to climate-related stresses?	High		
	11.1.3 Could the activity lead to beneficiaries having less means or options to withstand shocks resulting from extreme weather events (floods, storms, drought)?	High		
	11.2 Could the activity lead to increases in greenhouse gas (GHG) emissions or to reduction of carbon sinks?		NO	The project will not generate any significant emissions of greenhouse gases or reduce carbon sink capacity. Many project activities have been designed to be low-emissions, as well as adaptive – e.g., the increase in vegetative cover during rehabilitation of catchments above irrigation reservoirs, SLM asset building and promotion of renewable energy for any buildings that are developed/rehabilitated.
	11.2.1 Could the activity lead to significant increases in GHG emissions during operation phase?	Medium		
	11.2.2 Could the activity lead to significant degradation or destruction of elements which absorbs and stores carbon from the atmosphere (trees, plants, soils)?	Medium		

12. Pollution Prevention and Resource Efficiency				
	12.1 Could the activity lead to significantly increased release of pollution to air, land, or water during construction or operation?		NO	None of the activities in the project will release pollutants into the air, soil or water. The project will not provide any agrochemicals, but rather

				will promote more environmentally sustainable methods while avoiding hazardous materials, or ozone depleting substances. Under Component 2, the project will introduce climate-smart agricultural practices, aimed at reducing the use of pollutants and increasing resource efficiency.
	12.1.1 Could the activity lead to a dangerous increase in release of pollutants (incl. noise) to air, land, or water during construction or as result of accidents?	Medium		
	12.1.2 Could the activity lead to a dangerous increase in release of pollutants (incl. noise) to air, land, or water during normal operation?	Medium		
	12.1.3 Will the activity lead to any open burning of plastic waste during construction or operation?	Medium		
	12.1.4 Could the activity lead to significant negative impacts on visual aesthetic values?	Medium		
	12.1.5 Could the activity lead to discharge of untreated wastewater to the environment?	High		
	12.2 Could the activity lead to procurement, transport, or use of chemicals, hazardous materials, or ozone depleting substances subject to international bans?		NO	No such materials will be procured, transported or used for this project.
	12.2.1 Could the activity lead to procurement, transport, or use of chemicals or other hazardous materials, including asbestos and ozone depleting gases which will not be handled and disposed of safely by following normal Standard Operating Procedures?	Medium		
	12.2.2 Could the activity lead to procurement, transport, or use of chemicals or other hazardous materials subject to international bans?	High		
	12.3 Could the activity lead to increased use of agro-chemicals?		NO	The project will not provide any agrochemicals, but rather will promote more environmentally sustainable methods while avoiding hazardous materials, or ozone depleting substances.
	12.3.1 Could the activity lead to use of agro-chemicals that potentially could be replaced or reduced by alternative environmentally friendly products or techniques?	Medium		
	12.3.2 Could the activity lead to use of pesticides or other chemicals, which could have an unintended effect on non-target species and environment?	Medium		

	12.3.3 Could the activity lead to use of WHO class 1a, 1b, or Class II pesticides without proper application of the International Code of Conduct on Pesticide Management?	High		
	12.3.4 Could the activity lead to use of pesticides, herbicides or other chemicals or materials containing or polluted by Persistent Organic Pollutants (POP's) as listed by the Stockholm Convention?	High		
	12.4 Could the activity lead to very high resource use (such as fuel or water) during operation?		NO	No major use of fuel, water or other resources in planned in this project.
	12.4.1 Could the activity lead to more than 100,000 litres per year of diesel, in vehicles and/or generators?	Medium		
	12.4.2 Could the activity lead to major use of water from unsustainable sources (bottled and transported, gradual depletion of ground- or surface-water, change of local waterways etc.)?	Medium		
	12.5 Could the activity lead to generation or transport of hazardous or non-hazardous waste which could have negative environmental impacts?		NO	No waste that could have negative environmental impacts is expected to be generated.
	12.5.1 Could the activity lead to significant increase in generation of waste that will not be disposed of in an environmentally friendly manner (recycled, re-used, or recovered) by WFP, beneficiaries, or third parties?	Medium		
	12.5.2 Could the activity lead to generation of hazardous waste which will not be handled and disposed of safely by following normal Standard Operating Procedures?	Medium		

13. Public Health				
	13.1 Could the activity lead to increased risk to community health and safety from use of equipment, materials, transportation, or natural hazards?		YES	The rehabilitation of multi-purpose minor irrigation reservoirs could potentially increase existing levels of transmission of water-borne or water-based diseases.
	13.1.1 Could activities during construction or operation phase lead to increased community risks from e.g., increased traffic, inappropriate design or use of equipment and materials which would not be handled by following normal Standard Operating Procedures?	Medium	NO	

	13.1.2 Could the activity cause community exposure to water-born, water-based, water-related, vector-born or communicable diseases?	Medium	YES	The rehabilitation of multi-purpose minor irrigation reservoirs could potentially increase existing levels of transmission of water-born or water-based diseases. Also, depending on the level of depth, the water ponds may represent a risk of drowning for children.
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14. Physical and Cultural Heritage				
	14.1 Could the activity negatively affect heritage?		NO	During community level and stakeholder consultations, no proposed project activities were identified as to affect the physical and cultural heritage.
	14.1.1 Could the activity negatively impact any form of physical or cultural heritage?	Medium		

15. Land and Soil Conservation				
	15.1 Could the activity lead to negative impacts on soils, groundwater, water bodies, water ways, coastal areas, or the sea		NO	Project activities will not pose risks to land and soil conservation, but rather will be specifically designed to address land degradation and promote sustainable land management and erosion control.
	15.1.1 Could there be significant impacts on quality or quantity of surface- or groundwater?	Medium		
	15.1.2 Could the activity lead to major changes in flow regimes of local waterways, conditions of water bodies, or coastal areas?	High		
	15.1.3 Could the activity lead to increased soil erosion, run-off, or significant changes to soil characteristics?	Medium		
	15.1.4 Could the activity lead to serious soil erosion (e.g., major gullies, sheet erosion etc.) or major detriments to soil quality over a large or locally important area?	High		
	15.2 Could the activity lead to negative impacts on forests, wetlands, farming or grazing land, or other landscape elements of ecological or economic importance?		NO	Afforestation activities will additionally support protection and enhancement of lands and soil. Component 2 will promote, amongst others, soil and water conservation management practices aiming at restoring degraded land and improving ecosystem-based services. All activities are of small-scale (managed at individual, household, or community level) and any possible residual impact would be negligible and readily remediable.
	15.2.1 Could the activity lead to degradation or fragmentation of local forest areas, wetlands, prime	Medium		

	farming or grazing land, or other landscape elements of ecological or economic importance?			
	15.2.2 Could forests, wetlands, prime farming or grazing land, or other landscape elements of ecological or economic importance be almost fully destroyed or degraded or heavily fragmented?	High		
	15.2.3 Could the activity lead to significant increase in consumption of locally sourced fuelwood?	Medium		

The screening was conducted at project proposal stage and based on information available at this time. Due to the unidentified sub-projects (USPs) of Component 2, some of the screening questions triggered a **“Medium risk” categorization, or ESS category B**. USPs will be further screened prior to implementation to identify potential new risks and adopt appropriate mitigation measures to be captured by relevant ESMPs for implementation, monitoring and reporting.

Indirect, transboundary and cumulative risks and impacts

In addition to the potential direct risks posed by project activities, the environmental and social risk screening process included a consideration of potential indirect, transboundary and cumulative risks and impacts that could result from the project activities. These considerations have been integrated into the risk screening set out above, and in Part II.N of the proposal. The following table provides a summary of the more overarching of the potential indirect, transboundary, and cumulative impacts and risks.

Risk category	Description	Significance	No further assessment required
Transboundary risks	The project areas in the two countries are not contiguous and inland project activities under Component 2 will not result in any coastal or marine impacts that could lead to physical or environmental transboundary risks. Project activities under Component 1 that will lead to enhanced LMCS and institutionalisation of this in both countries, as well as leveraging regional platforms to share good practices on LMCS, are expected to result in positive social and institutional transboundary impacts, as well as enhancing the climate resilience of participants’ livelihoods in the rural areas of the project localities.	No risk; No physical or environmental transboundary risks No risk; Positive social / institutional transboundary impacts are expected	X
Indirect and/or cumulative risks: water access	Improved access to water for irrigation and household use (Activities of Outcome 2.2) may lead to increased consumption of water for irrigation – through inefficient systems and scaling up – and other uses, including previously non-existent uses (e.g. car/motorcycle wash, pour-flush toilets). This may lead to continued strain on the hydrological system and for new uses may also lead to contamination of soil and water from non-agricultural	Low risk; mitigation measures included in table below	

	<p>sources. Improved access to water for households may on the other hand improve overall health and thus reduce the burden on health services. Potential mitigation measures on potentially adverse impacts include, but are not limited to good water governance, strengthening of water management committees, implementation of good agricultural and irrigation practices, awareness raising and capacity building in water, sanitation and hygiene.</p> <p>Water ponds may represent a risk of drowning for children. This can be reduced by including this issue in the project's awareness raising activities, liaising with local schools to include this risk in their sensitisation of children, and by providing signs that graphically indicate the risk of drowning and the water depths.</p>		
Positive cumulative effects: water cycle and environment	The restoration of the catchment area and the reservoirs (Output 2.2.1) combined with Good Agricultural Practices and traditional adaptation measures (Output 2.1.1) is likely to cumulatively improve groundwater recharge and water retention in soils, as well as result in an overall healthier environment compared to each measure individually.	No risk; Positive cumulative effects	X
Cumulative economic effects	<p>Combining financial literacy trainings (activity 2.1.2.2.) with improved market access and value chain analysis and development (2.1.2.1., 2.2.2.1., 2.2.2.5.) will improve capacity on the participant side and strengthen and expand markets due to larger numbers of capable market participants.</p> <p>The strengthening of good agricultural practices and planting of climate-adapted local crops might result in adaptations in the market to cater to the shifted needs developed in the scope of this project.</p>	No risk; Positive cumulative effects	X

3. Environmental and social risk management and monitoring plan

The ESMP designed for this project will track identified risks, or any new risks, ensuring they are properly monitored, evaluated, and reported upon. The proposed project will fully comply with national laws, the Adaptation Fund's Environmental and Social Policy and WFP's environmental and social standards.

3.1 Management and monitoring of the residual risks related to the overall project design

Principle	Risk identified	Mitigation measure	Responsibility	Monitoring indicator	Budget
Access and Equity	Unequal access to resources or creation of intra-community tensions (medium)	Targeting and implementation approaches that are highly tailored to each community (no rubber stamp approach for all villages), implemented by local partners that know the context well;	Project staff, implementing partners	-	no additional budget
		Presence of a local languages interpreter in all consultations, to facilitate consultations in the language of all community members targeted, including the PVTGs in Odisha;	Project staff, implementing partners	language used during consultations	no additional budget
		Ensure in-depth consultations with communities and stakeholders are conducted throughout project implementation to ensure that any barriers to access and equity can be overcome in line with the AF's ESP.	Project staff, implementing partners	nr of consultations per year	no additional budget
		Where possible, set up structures to manage new assets (such as fish ponds) at community level or through associations. These structures should maintain similar conditions for men and women	implementing partners	% of new assets managed at community level or through associations ²⁸⁴	no additional budget
		Locally and culturally appropriate channels of dissemination of LMCS to be identified in all project localities	implementing partners	-	no additional budget
Gender Inequality	Factors influencing the discrimination against women in terms of access to land and labour	Where possible, set up structures to manage new assets (such as ponds or afforested areas) at community level or through associations. These structures should maintain similar conditions for men and women.	implementing partners	% of new assets managed at community level or	no additional budget

²⁸⁴ the associations are created to facilitate equal access (of different households or ethnic groups) to the assets

	forced participation could pose some risks of women being excluded from the project's benefits in the long run.			through associations ²⁸⁵	
		Activities target a mix of at least 52 percent women, and a mix of vulnerable households to be specified during project inception	implementing partners	nr of beneficiaries, disaggregated by ethnicity	no additional budget
		Awareness-raising and sensitisation sessions on land tenure rights and behavioural change for both women and men (particularly community leaders) to be held in the communities focusing on equal rights and rental conditions for men and women.	Implementing partners	Nr of sessions held (yearly)	no additional budget
Indigenous Peoples	Presence of PVTGs in India and potential presence of Veddha indigenous people in project locations	Free, Prior and Informed Consent (FPIC) process will be sought during the inception stage of the project, when specific localities will be identified.	Project staff, implementing partners	Signed FPIC documents	no additional budget ²⁸⁶
		Indigenous Peoples Plan will be elaborated and implemented in coordination with the project activities	Project staff	IP Plan elaborated	no additional budget
Conservation of biological diversity	Some activities could potentially have adverse impacts on biodiversity, leading to a deterioration of biological diversity	No introduction of alien crop/plant species	Project staff, implementing partners	Plant/crop varieties used in the project	no additional budget
		No activity in conservation areas and/or natural reserves	Project staff, implementing partners	Project location maps	no additional budget
		No introduction of GMOs	Project staff, implementing partners	Plant/crop varieties used in the project	no additional budget
Public health	The rehabilitation of multi-purpose minor irrigation reservoirs could potentially increase existing levels of transmission of	Add indigenous larvae-eating fish species that feed on mosquito larvae to the water ponds	Project staff, implementing partners	Nr of ponds where larvae-eating fish species were introduced	no additional budget

²⁸⁵ the associations are created to facilitate equal access of men and women to the assets

²⁸⁶ Will be carried out as part of other trainings/workshops/sessions

	water-born or water-based diseases.				
		Sensitize communities on using and storing water in a safe and efficient way.	Implementing partners	Nr of sensitization sessions	no additional budget
	Water ponds may represent a risk of drowning for children	Awareness and signs indicating the risk of drowning and the water depths Liaising with local schools to include this risk in their sensitisation of children	Implementing partners	Nr of awareness signs installed Nr of schools carrying out sensitisation	no additional budget

The National Project Coordinators, with the support of the EEs and WFP, will endeavour to collect and report all available annual data. This will be discussed annually with all stakeholders during the meetings of the project steering committees.

3.2 Management of the potential risks stemming from USPs under Project Component 2

As mentioned before, the project includes USPs under Component 2. The details of these USPs will be defined during the implementation of the project, on the basis of the outcomes of Component 1. The USPs under Component 2 will be designed by the communities through participatory community consultations.

Once the USPs under Component 2 have been defined, they will be screened by means of the Environmental and Social Screening Tool (presented in section 2 of this Annex) to ensure that any potential unwanted impacts of these activities are anticipated, avoided, reduced, or mitigated. The screening tool classifies activities into risk categories (low, medium, high), which determine what further action is required. Potential risks, whether social or environmental, will be identified at community level.

Low Degree of Concern (Category C) corresponds to a Category C activity and indicates minimal or no adverse impacts. Small impacts can be readily avoided or mitigated by adhering to WFP's E&S standards and the Adaptation Fund Principles. No further E&S Safeguard action is required beyond the application of the guiding principles, stakeholder engagement, and stakeholder access to complaints and grievance processes.

Medium degree of concern (Category B) corresponds to a Category B activity and indicates that there is expected to be some reversible impacts of limited magnitude and which can be mitigated. The difference between a Category A and a Category B activity is the greater possibility to prevent or mitigate some or all adverse impacts. If the impacts cannot be avoided by design changes, mitigation measures must be implemented. These measures will be included in the environmental and social management and monitoring plan and reported on to the Adaptation Fund.

High degree of concern (Category A) corresponds to a Category A activity and indicates that that highly significant or irreversible adverse impacts can be expected. If the activity design is not changed to avoid or mitigate those impacts, the activity should not be implemented, as it would infringe WFP policies.

Any identified risks will be subject to monitoring and follow-up to ensure that planned mitigation measures are implemented and effective.

Annex 3: GRIEVANCE MECHANISM

Principles of the Grievance Mechanism

WFP has a set of minimum standards and standard operating procedures that apply to all complaints and feedback mechanisms it sets up in countries where it is working.²⁸⁷ The minimum standards include, amongst others.

- involvement of the beneficiaries in the design of the mechanism;
- ensure that people understand and agree to how the complaint and/or feedback will be processed;
- ensure that the mechanism is accessible;
- ensure confidentiality and professionalism;
- ensure a referral system for protection-related complaints;
- design procedures for high priority cases (fraud, corruption, sexual exploitation and abuse).

The stakeholders in the project, including the representatives of the indigenous peoples, agreed on the following additional principles for the grievance mechanisms:

- it should allow for anonymous complaints;
- it should be accessible by illiterate beneficiaries;
- it should be accessible by beneficiaries who have no access to telephone;
- it should include different, parallel channels, to allow for complaints about different aspects of or actors involved in the project (e.g., complaints about mistargeting, negative impacts, underperformance of certain actors, fraud, etc.);
- civil society organizations should be involved in the management of complaints.

Channels of the Grievance Mechanism

Complaints and feedback can be filed through one or more of the following channels:

Toll-free phone number: WFP Sri Lanka and WFP India have established a toll-free number. Anyone affected by or involved in the project can call this number or send an SMS to file a complaint or feedback. The complaints and feedback are handled by a call centre that records them in a logbook and transmits them to the Complaints Management Committee CMC (more info in next section). The call centre offers services in the most common languages of the country.

Suggestion boxes: Portable, locked suggestion boxes will be placed in central locations in the communities, such as the community house or the market area, to allow communities or community members without access to phones to provide feedback or file complaints. The locked suggestions boxes will be collected and opened on agreed times. The keys will be held by different people from identified partners, local leaders and community members who will open them on announced dates. The beneficiaries will be given a chance to suggest the individuals assigned with these tasks. All received complaints and feedback will be recorded in a logbook and will be transmitted to the Complaints Management Committee.

In addition to the above, cooperating partners, to be identified during the Inception Phase, will act as “grievances recipients”. They will act as **help desks** for the beneficiaries: they will provide information about the project and the selection and targeting criteria; but they will also accept and transfer complaints and feedback. This allows illiterate community members to file complaints or feedback. All received complaints and feedback will be recorded in a logbook that will be transmitted to the Complaints Management Committee. Complaints concerning protection, fraud, or sexual abuse or exploitation must be transmitted immediately to the Complaints Management Committee.

Directly with stakeholders: Community members and people affected by the project can also file complaints or feedback directly with the partners that visit the communities, such as NGOs, civil society, WFP field staff, government services, etc. The feedback and complaints received through this channel

²⁸⁷ WFP (2017) *Minimum Standards for Implementing a Complaints and Feedback Mechanism*, also available at: <https://docs.wfp.org/api/documents/310fde2bfbfa4bc8b3ecabe44c0f0815/download/>

also need to be logged in the logbook (responsible: project secretary, partners send him/her by email or telephone the information he/she records- possibility to set up a google-drive document).

Procedures of the Grievance Mechanism

A Complaints Management Committee will be set up. It will include representatives of different stakeholders: WFP country office, WFP field offices, cooperating partners, government representatives, and representatives of the different communities and PVTGs where appropriate. This committee will review all complaints and feedback and will forward them as follows:

- complaints and feedback about the project setup, beneficiary selection, targeting, and implementation are forwarded to the Project Management Committee;
- complaints about fraud or sexual abuse or exploitation are directly forwarded to the WFP Country Director; if they involve WFP staff the Country Director forwards them to the WFP Office of Inspections and Investigations;
- protection concerns (clinical, legal, psychosocial, security) are referred to external protection-mandated partners.

Sustainability of the grievance mechanism

The call centre operators, community committees and Complaints Mechanism Committee will be trained on how to handle and process feedback and complaints. They will be recorded in logbook with limited access.

Information on the functioning of the mechanism will be widely disseminated among beneficiary communities and other communities that may be impacted by project activities. Communities will be made aware that the grievance mechanism will accept complaints also related to gender equality and women's empowerment. Project visibility materials such as sign boards and brochures will include information about the complaints mechanisms.

Key components of the grievance mechanism will remain in place after the completion of the project:

- the toll-free number is in place and will remain in place for all WFP programmes and activities in India and Sri Lanka;
- the digital version of the log book, from which personally-identifying information is deleted, will be retained for 10 years after the closure of the project;
- the data and evidence of any complaints that were escalated to HQ level for investigation by the Office of Investigation will be permanently retained.

Annex 4 List of national and sub-national stakeholders contacted – Concept Note and Full Proposal

SRI LANKA NATIONAL LEVEL			
Name	Organisation	Position	Sex
Dr. Sunimal Jayathunga	Ministry of Environment	Additional Secretary	M
Mr. Rifa Wadood	Ministry of Environment	Director Air Resources and National Ozone Unit	M
Dr. Ajantha Silva	Ministry of Agriculture	Additional Secretary	M
Dr. Gamini Samarasinghe	Ministry of Agriculture	Additional Secretary	
Mr. P. Jayanetti	Ministry of Agriculture	Deputy Director (Projects)	M
Mr. Sisira Ekanayake	Ministry of Agriculture	Deputy Director (Technical)	M
Ms. Kumudini Vidyalkakara	Climate Change Secretariat	Director	F
Ms. Dakshika Pathirana	Climate Change Secretariat	Assistant Director	F
Ms. Shyamali Priyanthi	Climate Change Secretariat	Environment Management Officer	F
Ambika Tennakoon	Climate Change Secretariat		F
Dr. Susil Silva	Dept. of Animal Production & Health	Director	M
Ms. Anusha Warnasuriya	Department of Meteorology	Director (Climate Change Research)	F
Dr. I. M. S. P. Jayawardena	Department of Meteorology	Director (Weather Forecasting Decision-making)	F
Dr. W.W. Weerakoon	Department of Agriculture	Director General	M
Dr. R. Punyawardena	Department of Agriculture	Principle Scientist	M
Dr. H. Kadupitiya	Department of Agriculture	Director (National Resource Management Centre)	M
Mr. J. R. Sudasinghe	Department of Agriculture	Director (Extension)	M
Mr. A. L. Abeyratne	Department of Agrarian Development	Commissioner General	M
Mr. R. Wijekumar	Department of Agrarian Development	Commissioner (Development)	M
Eng. R. A. Senanayake	Department of Agrarian Development	Head of Water Management	M
Eng. N. Sivalingam	Department of Agrarian Development	Deputy Commissioner (Development)	M
Mr. Sugeeswera Seenipella	Dept. of Irrigation	Director Irrigation	M
Mr. R.B.P. Thilakasiri	Ministry of Samurdhi Development	Director General – Samurdhi Authority	M
Dr. Inoka Suraweera	Ministry of Health	Director (Environmental and Occupational Health Unit)	F
Ms. Hasanthi Dissanayaka	Ministry of Foreign Affairs	Director General (Ocean Affairs, Climate Change, Environment)	F
Mr. R. H. W. A. Kumarasiri	Department of National Planning	Director General	M
Ms. M. Gangatharan	Department of National Planning	Additional Director General	F
Mr. Rohitha Wikramasinghe	Department of National Planning	Director	M
Rajitha Kisagothami Lankathilaka Jagoda	Department of National Planning	Deputy Director	F
Mr. Samantha Bandara	Department of External Resources	Director	M
Mr. Sagara Abeyratna	Department of External Resources	Deputy Director	M
Dr. K. M. A. Bandara	Forest Department	Conservator General	M
Dr. K.T. Premakantha	Forest Department	Additional Conservator General	M
Mr. P. Nimal Chandraratne	National Aquatic Resources Development Authority	Director General	M
Mr. H. P. Somathilaka	Project Management Unit for WFP, Ministry of Finance	Deputy Director	M

Mr. K. P Nishantha	Project Management Unit for WFP, Ministry of Finance	Deputy Director	M
Mr. D. M. T. U Dissanayake	Wilgamuwa Divisional Secretariat, Matale District	Divisional Secretary	M
Andrea Berardo (and other WFP CO team members)	World Food Programme, Sri Lanka	Deputy Country Director	M
SRI LANKA DISTRICT LEVEL			
Mr. Labert-	Agrarian Development office/center (Potkerni) Mannar	Agrarian Development Officer (Potkerni)	M
Ms. S. Ranjana Agrarian	Vavuniya- Agrarian Development Office / center (Chettikulam) Vavuniya	Development Officer (Chettikulam)	F
Mr. Wasanthan	Agrarian Development Office/ center (Puthukkudiruppu) Mullaitivu	Agrarian Development Officer	M
Mr. Manokanthan	Agrarian Development Office/Center (Pankulam) Trincomalee	Agrarian Development Officer	M
Mr. A. Marinkumar	Agrarian Development office (Mannar)	Assistant Commissioner of Agrarian Development	M
Mr. N. Vishnudasana	Agrarian Development office (Vavuniya)	Assistant Commissioner of Agrarian Development	M
?	Agrarian Development Office (Mullaitivu)	Assistant Commissioner of Agrarian Development	?
Ms. Waruni	Agrarian Development Office (Trincomalee)	Assistant Commissioner of Agrarian Development	F
Mr. Nadun Jayasekera	D.A.D.office, Monaragala	Assist. Commissioner Agrarian development	M
Mr. Chamal Nalinda	DAD office – Siyamabalanduwa	Assistant Commissioner	M
Mrs. D. Weerawansa	DAD – Kurunegala	Deputy commissioner	F
Mr. S. Senadheera	DAD – Kurunegala	Assist. Commissioner	M
Mrs. S. Muthnayake	Madahapola A.D center – Polpithigama D.S division	Agri divisional officer –	F
INDIA NATIONAL LEVEL			
Mr. Ravi Shankar Prasad	Ministry of Environment, Forest and Climate Change (MoEFCC)	Additional Secretary	M
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Mr. Neelesh Kumar Sah	Ministry of Environment, Forest and Climate Change (MoEFCC)	Joint Secretary	M
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Mr. Charanjit Singh	Ministry of Rural Development	Additional Secretary	M
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Shri Jayaram Killi	Ministry of Rural Development	National Mission Manager – Farm Livelihood NRLPS	M
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Mr. Rohit Kumar	Ministry of Rural Development	Joint Secretary	M
Mr. Dharamveer Jha	Ministry of Rural Development	Ministry of Rural Development	M
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Mr. Pankaj Tyagi,	MoA&FW	Director (RFS, Oil Seeds)	M
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Dr. K.K. Singh	IMD	Addl DG, In-charge of Agrometry	M
Mr. Anand Kumar Sharma	IMD	SCG	M
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Ms. Purvi Joshi	Ministry of Jal Shakti	Consultant National Water Mission	
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ODISHA STATE			
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Ms. Mona Sharma	Department of Environment, Forest and Climate Change	Secretary	F
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Mr. Sabyasachi Hota	Odisha State Disaster Management Authority (OSDMA)	Chief General Manager	M
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Dr. HR Biswas	IMD	Director Odisha	M
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Dr. Muthu Kumar	Department of Agriculture and Farmers' Empowerment	Director	M
Mr. Basant Kumar Dash	Fisheries and Animal Resources Development Department	Joint Director	M
Mr. Santosh Kumar Dash	Department of Co-operation	Additional Secretary/ Managing Director Markfed, Odisha	M
Mr. Kamal Lochan Mishra	Odisha State Disaster Management Authority	Executive Director, OSDMA	M
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Mr. Kailash Dash	Regional Centre for Development Cooperation (RCDC)	Executive Director	M
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Akshay Biswal	Oxfam		M
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Mr. Ashok Singha	CTRAN (NGO/think-tank)	chief Executive officer	M
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Dr. Geethalakshmi V	TN Agriculture University	Vice Chancellor	F
Dr. Suresh Kumar	TNAU	Scientist	M
Ms. Mageswari	Public Works Department	Director	F
Mr. S. Sree ram	Chief Project director	TNGCC	M
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M Bhavani	Water Resource Department	Deputy Secretary	F
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Vismiju Vishwanathan	Department of Environment	Deputy Conservator of forest	M
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Mr.Kumar	Department of Rural Development	ADRD (MGNREGS)	M
J. Jayakanthan	Fisheries Department	Commissioner	M
Gagan Deep Bedi	Department of Agriculture	Principle Secretary	M
CM Muralidharan	Food and Agriculture Organisation (FAO)	Consultant for South Asia	
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A. Natrajan	Block Ramanathapuram	Block Development Officer	M
M. Arun Prasath	Block Ramanathapuram	Assistant engineer	M
S. Vignesh	Block Ramanathapuram	Assistant engineer	M
R. Annapoornadevi	Block Ramanathapuram	Junior engineer	M
Dr. Murali KS	MS Swaminathan Foundation	Executive Director	M
Dr Rengalakshmi	MS Swaminathan Foundation	Scientist- lead Climate Change Adaptation	F
Dr. Velivezhi	MS Swaminathan Foundation	Lead Fisheries	F
ANDHRA PRADESH STATE			
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	Department of Water Resources	Chief Engineer	M
	Department of Water Resources, Govt of Andhra Pradesh	Chief Engineer, Minor and Medium Irrigation	M
Dr. Rengalaxmi	MSSRF	Director Agronomy	F
Shri. Mahmud Imtiaz	AP SRLM	Managing Director	M

India: Sub-national list of stakeholders consulted during Full Proposal development
Stakeholders / Experts for WFP Assessments in Andhra Pradesh

Kadapa district- Rayachoty Mandal

S.No.	Name of the person	Designation and Department	Place
1.	Mr. Dhivakar Babu	Mandal Agriculture Officer	Raychoty

2.	Ms. Sreelatha	ADA	Raychoty
3.	Dr. Veeraiah	Head, KVK	Utkur,Kadapa
4.	Mr. Anjaneyalu	Panchayat Secretary	
5.	Mr. Chandrasekar	VRO, Village Agriculture Assistant at Sachivalayam	Katamayakunta
6.	Mr. Rathana Kumar	Digital Assistant	Katamayakunta
7.	Mr. Nagendra Kumar	Veterinary Assistant	Katamayakunta
8.	Mr. S Shamsheer	Panchayat member	Katamayakunta
9.	Ms.C Aruna	Animator – IKP	Gorlamudiveedu
10.	Ms. S Meena	Integrated Community Resource Person of ZBNF	Cherlopalle
11.	Ms. Vasantha Bai	CDPO	Raychoty

Anantapur –Talupula Mandal

S.No.	Name of the person	Designation and Department	Place
1.	Mr. Mohan Vijaykumar	Deputy Director, Andhra Pradesh Drought Mitigation Project (APDMP)	Anantapur
2.	Ms. Roja Pushalatha	ADA, Soil Conservation and Training Institute	Anantapur
3.	Mr. SriLakshmana Naik	DPD, ZBNF	Anantapur
4.	Dr. Ravi Kishore	Scientist, Agriculture Extension, KVK	Anantapur
5.	Dr. K Vemana	Principal Scientist, Plant Pathology	Kadiri
6.	Mr.B Srinivas	Secretary, DROPS NGO	Raychoty
7.	Ms. Tulsi Devi	FES, District coordinator of Anantapur	Madanapalle
8.	Mr. K Harinatha Reddy	President, Vepamanupeta panchayat	Chedhalavanlapalle

List of Stakeholders / Experts for WFP Assessments in Odisha

Kalahandi District

1. Jungarh block

2. Th. Rampur block

S. No	Name	Designation and Department	Place
1.	Naukeswar Nag	Assistant Agriculture Officer	Junagarh
2.	Maheswar Nag	Assistant Horticulture Officer	Junagarh
3.	Hemanta Rout	VAW	Junagarh
4.	Gourishankar Patro	Krushak Sathi,	Tala Jirang
5.	Ganesh Padhu	Lead farmer	Junagarh
6.	Ashok Patnaik	Secretary	Kartabya
7.	Dhrubakanta Majhi	Sarapancha	Kaniguma
8.	Chandramani Gouda	Ward member	Taragaon

Nuapada district

1. Khariar block
2. Boden block

S. No	Name	Designation and Department	Place
1.	ManabodhMajhi	Assistant Horticulture Officer	Boden
2.	Sanjay Patra	Block Development Officer	Khariar
3.	Bhutesh Kumar Meher	Assistant Director	Lokadrusti, Khariar
4.	Dr. SaswatiPattanaik	Senior Scientist & Head KVK,	Nuapada
5.	NirapamMahanti	Horticulture officer	Khariar

List of Stakeholders / Experts for WFP Assessments in Tamil Nadu**Ramanathapuram District:**

1. Kamuthi block
2. Thiruvadanai block

S. No	Name	Designation and Department	Place
1.	Prof. T. Ragavan (Agronomy)	Prof & Head & PC-KVK	ARS, TNAU, Paramakudi Ramanathapuram
2.	Ms. M. Venkateshwari	SMS (Meteorology)	DAMU, Ramanathapuram
3.	Ms. Geethanjali	Agriculture Officer	JDA Office Ramanathapuram
4.	Mr. Santhosh	Agriculture Officer	Kamuthi
5.	Mrs. Kalaivani	Assistant Agriculture Officer	Thiruvadanai
6.	Mr.Chandhrmohan	Block Development Officer	Kamuthi
7.	Mr.Sevugaperumal	Block Development Officer	Thiruvadanai
8.	Mr. Arun Kumar K	District Development Manager, NABARD	Ramanathapuram
9.	Mr. Gandhirajan	Secretary, Sketch Trust	Muthukalathur, Paramakudi
10.	Ms. Visupavathi	CDPO	Ramanathapuram
11.	Mr. Pothan	Panchayath President	Natham, Kamuthi
12.	Mr. Arjunan	Panchayath President	Kodipangu, Thiruvadanai
13.	Mrs. Kaleswari	SHG Member	Kodipangu

Dharmapuri District :

1. Pennagaram block
2. Karimangalam block

S. No	Name	Designation and Department	Place
1	Dr. M.Vijayakumar	Programme Coordinator	Krishi Vighyan Kendra, Dharmapuri
2	Dr. S.Srividhya	Assistant Professor (Horticulture)	Krishi Vighyan Kendra, Dharmapuri
3	Dr. R.Thangadurai	Assistant Professor (Veterinary and Animal Service)	Krishi Vighyan Kendra, Dharmapuri
4	Dr. Priya	Agricultural Officer	Pennagaram,Dharmapuri
5	Mr. Subramaniyan	Assistant Director of Horticulture	Kariamangalam, Dharmapuri
6	Mrs. Bhuvaneshwari	Assistant Director of Horticulture	Pennagaram,Dharmapuri

7	Dr. Saravanan	Veterinary doctor, Animal Husbandry Department	Pennagaram,Dharmapuri
8	Mr. Vadivelan	Block Development Officer	Pennagaram,Dharmapuri
9	Mr. M. Ravi	Assistant, Block Development Officer	Pennagaram,Dharmapuri
10	Dr. Parasuraman	Programme Coordinator	Regional Research Station - Paiyur, Dharmapuri
11	Dr. C. Sivakumar	Professor (Agronomy)	Regional Research Station - Paiyur, Dharmapuri
12	Mr. Sivananam	Assistant Agricultural Officer	Kariamangalam, Dharmapuri
13	Mr. Dinesh	Agricultural Officer	Chittarapatti, Dharmapuri
14	Mr. Praveen Babu	District Development Manager	Dharmapuri
15	Jansirani	CDPO	Dharmapuri
15	Mr. Mohanram	Director	The Institute of Entrepreneurship Development, Dharmapuri
16	Mr. Satish	Punchayat President	Kalappampadi, Dharmapuri
17	Mrs. Charumathy	Punchayat President	Hannumathapuram, Dharmapuri

Annex 5 Report on community consultations in Sri Lanka and India

A5.1 Introduction

Two rounds of community consultations were carried out in the targeted dryland areas in both India and Sri Lanka, one during Concept Note and one during Full Proposal development, to understand the climate vulnerability and adaptation needs of community members. For consistency, each community received the same set of questions, centring around their livelihoods, perceptions and impacts of climate change, support from external agencies, and adaptation gaps and needs. Wherever possible, these were disaggregated for women, men, female youth, male youth, elderly people, and vulnerable groups. Some sub-national authorities and service providers were also present at these meetings.

A5.2 Summary of community consultations conducted during Concept Note development

1. Revised approach to community consultations

The community consultations carried out in order to design this Concept Note adopted the revised approach set out in Part II.I of the CN, in response to the restrictions and lockdowns associated with the coronavirus pandemic. The consultations focused on: (i) Basis of livelihoods in the area / community, disaggregated (women, men, female youth, male youth, elderly people, vulnerable groups); (ii) Perceived impact of climate change, and environmental challenges/opportunities, disaggregated; (iii) Support from external agencies, disaggregated; (iv) Coping mechanisms, disaggregated; and (v) Adaptation gaps / needs, and recommendations from community, disaggregated. Primary information was gathered on these themes. Despite limitations in size, time and ability to have separate meetings with different groups due to Covid restrictions, the in-person consultations still resulted in appropriate information to endorse and further develop the approved pre-CN into the current CN. A more detailed report on the community consultations carried out in each country is also available.

2. In-person consultations carried out

The following in-person community consultations were carried out in the Dry Zone of Sri Lanka:

- Matale district, in the dry zone division of Wilgamuwa, on 23 April 2021, gathering 34 farmers: men (17) and women (17), of all age groups, and a vulnerable group, as enumerated in the table below.

	Youth 18-25 y		Mid 26-60 y		Elderly 61+ y		Vulnerable groups (all ages)	
	Men	Women	Men	Women	Men	Women	Men	Women
Number	0	1	9	12	3	1	5	3
	0%	3%	26%	35%	9%	3%	15%	9%

A village context analysis (VCA) was conducted in the Dry Zone for the Last Mile Climate Services (LMCS) pilot project implemented by the WFP Sri Lanka Country Office, which yielded directly relevant community-level information. The VCA survey was administered to 170 community members in two and three Grama Niladhari divisions in Monaragala and Mullaitivu districts, respectively.

The following in-person community consultations in the eastern states of India were carried out:

- Tamil Nadu: meeting held at the Horticulture park, Valanthuravai Village, Mandapam block, Ramanathapuram District, on 29 January 2021
- Tamil Nadu: meeting at Thangachimadam Village, Mandapam block, Ramanathapuram District, on 29 January 2021
- Odisha state: community consultation at the Balabhadra Patna Multi-Purpose Cyclone Shelter in Brahmagiri Block of Puri district, on 15 January 2021, with participants from four Gram Panchayats

Venue	Date	No. of women	No. of men	Total participants
TAMIL NADU STATE				
Horticulture park, Valanthuravai village, Mandapam block, Ramanathapuram District	29/01/2021	22	14	36
Thangachimadam Village, Mandapam block, Ramanathapuram District	29/01/2021	8	24	32
ODISHA STATE				
Balabhadra Patna Multi-Purpose Cyclone Shelter, Brahmagiri Block, Puri district	15/01/2021	30	18	48

3. Agriculture and other livelihoods

Tamil Nadu Valanthuravai village, Tamil Nadu: Agriculture is the primary livelihood in the village, which is comprised of 25 hamlets. The village has 484 hectares (ha) cultivated land of which 88.64 percent is under rainfed cultivation. The area under cultivation has declined by up to 60 percent in the last three decades, with conversion of agricultural lands to industries, housing and commercial purposes. Paddy rice, the main crop, is cultivated for one season and remains fallow for the rest of the year. The traditional paddy varieties "thida kattai and mattai", which are tolerant to intra-seasonal drought as well as flooding are cultivated by a large majority of the farmers. Vegetables are cultivated in homestead lands - tomato, brinjal, bhendi (lady finger), etc. The village has 20 percent of dry land where chilies, ground nut, gingelly (sesame), pearl millet and sorghum were cultivated in the past, now these lands are either left fallow or converted into coconut plantation. In the coconut fields, intercropping is practiced with groundnut, cowpea, gingelly, small onion, etc., up to three to five years of planting. Goats, poultry and cows also provide household income. Apart from farming, wage income is the main source of cash income to most families. Women are engaged in mat and basket preparation from palmyra leaves, but do not earn much from this activity due to the limited market, as well as availability of the leaves. Basketry is not economically viable, as palmyra trees are decreasing because people cut it for very low returns (Rs 100 per tree).

Thangachimadam Village, Tamil Nadu lies in the middle of Rameshwaram island, where the primary occupation is marine fishing. Both men and women fishers are in a vulnerable condition due to uncertainty in income generation through restrictions on fishing days, types of boats permitted to go to certain distances, etc., diminishing fish stocks, exploitation by middlemen, recurrence of natural hazards, and low economic viability. There is a lack of alternate livelihood options.

Odisha: Most of the participants in the consultation stated that they go for the kharif (sown at start of summer monsoon, harvested in autumn) crop, and sow paddy rice. Both men and women work. Productivity during the past few years has been reduced due to climate-related disasters, and is insufficient for self-consumption. Thus people depend on small-scale trading and fishing. Most households use traditional methods of cultivation, but mechanisation has started. Almost all households used to have livestock, but now only 10-15 percent of households have animals. Men have control over the produce from the field. With landownership in their names. Men stated that it was not admissible under the norms of Government for this to be in the name of females.

4. Perceived climatic and other changes

Sri Lanka Dry Zone: Matale district, dry zone division of Wilgamuwa: The majority of farmers considered that drought was continuously increasing. In addition, intense rainfall contributed to flash flooding and soil erosion, affecting productivity. The quantity of rainfall received however has diminished over time, while temperature increases are clearly felt. High temperatures during the dry season reduced the ability to cultivate, and also increased water evaporation and loss of soil moisture. The food-insecure season started from December and continued until February (when rainfall gradually decreased). Over the past five years, this has been increasing. The Yala season has been advanced to April from May, giving them less time for land preparation. This created crop losses due to pest attacks and increased the overall cost of production. Regarding environmental problems, the major issues expressed were intermittent rainfall and groundwater depletion, which occurred due to deep bore holes in the localities. Due to sand mining, rivers ran dry more frequently than in previous years.

Findings of the VCA survey: The farmers in both districts are of the view that the weather patterns have changed. Drought in Mullaitivu has become more significant, compared to Monaragala. During the rainy season, flooding too has become worse in Mullaitivu. The constraints faced by the farmers in Yala, 2020 are similar in the two districts. Wild animal damage is perceived to be the most serious, followed by pest attacks, unstable market conditions, and lack of fertilizer. Additionally, lack of irrigation water is a key challenge in Mullaitivu.

Tamil Nadu: In Valanthuravai village, both men and women farmers identified excessive rain and flooding, salinity, increased frequency of seasonal drought, reduced number of rainy days and increasing dry spells as direct climate risks, and noted that while two decades back, the normal sowing season started in July, it has now completely shifted to September/October, coinciding with NE Monsoon season. Extended dry spells and heavy downpours observed for more than three years have led to crop loss; for the current season this was 40 percent. Unexpected rains and extreme events are increasing, leading to flooding in the agriculture fields, made worse by slow drainage in the fields. Two decades ago they used to receive high-speed winds in late June/early July, but wind speed and duration of windy days has reduced in the recent past. Increasing pests and diseases are an indirect risks of climate change. Increasing infrastructure and industries threaten agriculture in the coastal areas through excessive abstraction of ground water and deteriorating soil and water quality.

In Thangachimadam Village, the diminishing diversity and quantity of the fish resources is due to a mix of climatic and non-climatic factors, such as degradation of coral islands, disappearance of coastal sand dunes, degradation of sea grass and seaweed beds, and sea erosion of the beaches.

Odisha: Significant climate change impacts are sea level rise; increased storm intensity, wind and rainfall; extreme droughts and heat waves; and recurring cyclones along the coast.²⁸⁸ These impacts negatively affect agricultural production, marine fisheries, biodiversity and human health. Participants in the consultation in Puri district confirmed these impacts, stating that the area is highly vulnerable to sea level rise due to the extensive low-lying area, frequent occurrence of cyclonic storms, high rate of coastal environmental degradation and non-sustainable development. Floods associated with heavy rainfall often affect crops and people. Participants did not distinguish between impacts on different groups. However, a 2017 study noted that climate change has a significant impact on activities that are usually the responsibility of women and girls, namely securing household water, food, and fuel. During drought/erratic rainfall, women and girls walk farther and spend more time collecting water and fuel. Girls may have to drop out of school to help their mothers with these tasks, continuing the cycle of poverty and inequity. Due to climate impacts on the health of crops and livestock, women, who often produce the food eaten at home, must work harder for less food.²⁸⁹

5. Impacts of these changes

Sri Lanka Dry Zone: Studies confirm that smallholder farmers cultivating under village irrigation systems are poorer and more vulnerable than those who have access to major irrigation.²⁹⁰ They have very limited market access, poor basic infrastructure such as roads, drinking water and communication, and are also disadvantaged due to other social and health issues. A delayed monsoon or heavy rainfall during the sowing or harvesting period can damage an entire cropping season. Climate change impacts differently on women and men in the Dry Zone of Sri Lanka. Women traditionally manage household water, family gardens and livestock and are on the frontline of managing impacts of reduced water availability and disaster impacts. This affects their own intra-household food security, which can be exacerbated during extreme climate events and in the aftermath of a disaster. Women take full responsibility for the care of children, persons living with a disability, and the elderly. In some districts, women's carer responsibilities are increased due to large numbers of people living with a disability.²⁹¹

Matale district, dry zone division of Wilgamuwa: The perceived climatic changes noted above are related to increased crop losses, pest attacks and impact on human health. The cost of the food basket has increased over the last decade. Additionally, from 2020 until the present, there was a sharp increase in food prices due to COVID-19 induced economic hardships. This has had a negative result on overall household expenditure patterns which is keenly felt, especially during the dry season. Chronically sick people (kidney disease patients) were unable to continue their agricultural activities or engage in any other work, rendering them more vulnerable.

Findings of the VCA survey: In both districts, more than 75 percent of the farmers are affected by climate hazards; paddy cultivation is the most vulnerable. Farmers faced water rationing and noted difficulty of working in the open areas during drought due to intense heat. For paddy cultivation, farmers noted flooding at unusual times, and rain during harvest time affecting the paddy. For other field crops (OFC), farmers noted prolonged drought and crop loss; water stress causing damage to pods/seeds; heavy insect attacks; fungal diseases due to unusual rain; and increased intense rainfall causing crop loss and soil erosion. Impacts on poultry included diseases due to heavy rains and death of chicks in heat waves. Inland fish production is affected by lack of fish during droughts. Daily wage earners experienced loss of work, both during heavy rain times and droughts; and intense heat in the fields.

Tamil Nadu: Irrigation through tanks and canals has significantly reduced in Tamil Nadu in recent decades, leading to more pressure on groundwater, which has also become more saline. Groundwater recharge is largely dependent on the monsoon, changes in which have led to an increasing frequency of droughts. Irrigation through wells has increased from 35.3 percent in 1970s to 60.73 percent in 2015-16. As marginal and small farmers hold nearly 91 percent of the total holdings in the state and farm 60.6 percent of the total area, monsoon failure/pressure on water resources ultimately affects them.²⁹²

Valanthuravai village, Tamil Nadu: Cropping intensity has reduced from two crops to only one per year, affecting households' income and food security. Many households are completely dependent on the rice distributed through

²⁸⁸Forest and Environment Department, Government of Odisha (2018)

²⁸⁹Oxfam review of the Odisha State Action Plan on Climate Change Phase I (2017)

²⁹⁰Aheeyar (2012) Climate change adaptation in water management for food security: Recent developments in Sri Lanka. A review of Existing Knowledge and Information. Sri Lanka Water Partnership.

²⁹¹ ADB (2015) Country Gender Assessment Sri Lanka, An Update <http://www.adb.org/sites/default/files/institutional-document/172710/sri-lanka-country-gender-assessment-update.pdf>

²⁹² Palanivelu, K. et al. (2019) Scoping Study Report of Indo-German Project: Water Security and Climate Adaptation in Rural India (WASCA): Tamil Nadu State. Study prepared for GIZ.

PDS, which meets only partial family requirements (5 kg/head/ month). Labour opportunities for men and women are also reduced, pushing men into non-farm employment outside the state or country. Increasing soil salinity has increased production risks, especially dry land crops such as chilies, legumes and millets. As a result, women's managerial role in agriculture has increased, on top of their existing social, reproduction and care responsibilities. Area under fallow has increased, leading to invasion by *Prosopis juliflora*; restoration is challenging after one year of fallow. Landless labour communities and other vulnerable groups increasingly depend on irregular non-farm employment outside the village.

Thangachimadam Village, Tamil Nadu: The primary impacts identified by women and men were on the availability of the fisheries resource, which has led to changes in the livelihoods away from fishing, as stated in section 6 below.

Odisha: In the Puri district, increased coastal erosion from the Bay of Bengal is causing loss of villages and farmlands into it. Damage to paddy crops and fisheries affects the economy and livelihood of households. High rainfall variability, flash floods, heatwaves in summer, and intense coastal flooding and cyclones result in long periods of food shortage. Participants noted low yield, poor human health, erratic rainfall, and change in vegetation, amongst other climate impacts. Shifting rainfall means the rabi season crops (sown in winter and harvested in spring) go dry, and a second crop is impossible. There is a very high percentage of sharecroppers and landless labourers. Community members experience climate change impacts on human health, through increased asthma, respiratory diseases, cardiovascular disease and stroke, food-borne diseases and malnutrition, mental health, etc. The Odisha State Action Plan on Climate Change Phase II notes that "traditionally, in the state females suffer more drudgery and suffer more in fetching water, collecting biomass for cooking and have relatively higher disease burden under similar circumstances due to poor nutrition".²⁹³ During drought years, the workload increases drastically for both men and women, with the new nature of workload affecting women most. When the men migrate in search of work, the temporary single status of women leads to material and sexual exploitation of them on many occasions.²⁹⁴

6. Response and coping strategies

Sri Lanka Dry Zone: Matale district, dry zone division of Wilgamuwa: In response to the lengthening of the food-insecure season, farmers sell valuables and productive assets as a coping strategy and also increase their indebtedness.

Findings of the VCA survey: Overall, farmers are aware of climate change adaptation practices. However, knowledge on farm water management needs improvement. Some farmers seek to use traditional sources of information to predict rainfall patterns such as wind patterns and cloud formation however, some farmers were of the opinion that over the years, these weather patterns are changing, which would be an indication that traditional knowledge alone may not serve them well in future cultivating seasons.

Tamil Nadu: Valanthuravai village, Tamil Nadu: Men and women farmers and agriculture labourers adopt diverse and multiple adaptation strategies to cope with the negative impacts, by changing agronomic practices at the individual level. These decisions are also governed by changes in socio-economic issues such as access to labour in the households, practices adopted in the neighboring land, etc.: Coping strategies include migration of men to non-farm sectors for employment - other states and countries; increasing number of goats and poultry in the household to reduce the risk inherent in crop cultivation, as well as ease in management of small ruminants compared to cropping; diversifying the homestead gardens with trees and vegetables for regular income by women²⁹⁵; seeking off-farm employment from government schemes by women – MGNREGA; and changes in the cropping system to long-term crops like coconut intercropped with cowpea, groundnut, etc.

Thangachimadam Village, Tamil Nadu: Predominant changes in livelihoods adopted by male fishers as a result of the reduced resource availability are becoming fishing labourers (in situ or migration), and diversifying into non-fishing sectors such as petty shops, drivers, and mechanics. Women in fishing households engage in economic activities such as mat weaving, fish vending, dried fish preparation etc., and participate in MGNREGA works. Women's dependence on micro credit is high. Recently there has been a surge in the suicide rate due to the economic crisis. Some families (men and women) are engaged in seaweed cultivation.

Odisha: As household level production is inadequate, families supplement their income and food from social safety net schemes such as PDS, school feeding and supplementary nutrition schemes for pregnant/lactating mothers and children, borrowing money from local money lenders, or developing other coping mechanisms. Most families do have MGNREGA cards, but the number of days of employment is not guaranteed. In the Puri district, migration to outside

²⁹³ Forest and Environment Department, Government of Odisha (2018) Odisha Climate Change Action Plan 2018 – 2023. page 160.

²⁹⁴ Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

²⁹⁵ Both livestock and homestead resource management are easier for women to manage along with household and care of elders/children at home.

states has become rampant in response to climate stresses. Women stated that they are particularly impacted when their (male) family members migrate to economically viable towns.

Climate information and services

Sri Lanka Dry Zone: Matale district, dry zone division of Wilgamuwa: The majority of farmers agreed that they did not especially regard weather advisories as they do not receive any detailed or localised information at present. Radio and TV broadcast of weather advisories are their main source of getting the information. There is limited mobile network penetration in the locality and smart phones are virtually unavailable. This is further compounded by the very low mobile signal coverage in the area. All farmers said they would like to receive short-term disaster information in advance within 1-5 days of the event, which would help them to prepare adequately. At present, the Department of Agrarian Development provides longer-term seasonal received predictions from the Met Department at the pre-seasonal meeting ahead of each season, however these are not fully localized to the context. There was generally a lack of trust in weather bulletins, due to past adverse experiences. SMS messages were preferred as most people had only analogue mobile phones.

Findings of the VCA survey: Overall, seasonal forecast is provided to about 20% of the respondents. Rainfall and temperature are the most important weather parameters for them. Farmers prefer to have short-term and long-term weather forecast about 3-10 days in advance. The farmers' common method(s) of receiving information are television and mobile telephones in both districts; Krushi (agriculture) radio and newspapers are also common in Mullaitivu and Monaragala. In both districts, people prefer to receive information mainly by meeting in-person, by telephone and by posters and leaflets displayed, in the predominant language of the area. Overall satisfaction level with Agromet service differ with 21% and 42% of the farmers reporting satisfaction in Monaragala and Mullaitivu districts, respectively. Most respondents reported not being aware of the types of Agromet services provided and the sources of information.

Tamil Nadu: Valanthuravai village, Tamil Nadu: Participants stated they have limited access to extension services; and information, awareness and access to different entitlement schemes and services are inadequate. Villagers have access to generic climate information through mass media (TV and radio), but this is not adequate to meet the challenges in the existing livelihoods. Relevant advisories are needed to manage climate variability/ change; advisories by agromet services are often very generic and high level and not usable by the community.

Thangachimadam Village, Tamil Nadu: No specific information received during consultation. Extreme event alerts are received, and information is provided on restricting the movement, etc.

Odisha: People access Government support – soft credit, inputs, etc. for agriculture and livestock. Mobile penetration is high, and people would like to receive relevant climate advisories. There are currently no climate advisories for slow onset events. More accurate availability and use of weather information is needed to enhance adaptation. Women in Odisha have considerably less access than men to critical information on weather alerts and cropping patterns, affecting their capacity to respond effectively to climate variability.²⁹⁶

7. Adaptation Needs

Sri Lanka Dry Zone: Matale district, dry zone division of Wilgamuwa: While farmers did get weather information from the radio and TV broadcasts, they agreed it would be helpful to have localised climate information ahead of the season. Extension services along with the climate advisories are needed, so that farming practices can become productive and efficient. Participants noted the need for other livelihood sources apart from agriculture. Women from farmer households (all age groups) expressed the desire for apparel manufacturing at household level and value addition to agricultural produce. Most of these women had been previously working in apparel manufacturing factories and had lost their jobs due to COVID-19-related economic conditions.

Findings of the VCA survey: Recommendations include enhancing farmers' technical knowledge on water management, soil conservation and climate adaptation practices, establishing model farms to share hands on experience, improved Agromet service, customized sharing of weather information using appropriate technology, further awareness raising on climate change, and relevant training to farmers and officials.

Tamil Nadu: Adaptation needs prioritised in research conducted in the coastal districts of Tamil Nadu were public awareness on water conservation; changes in farming practices (e.g. adjusting farming calendars); improving water efficiency, including through soil and water conservation measures; diversification of market and products, and a

²⁹⁶ Oxfam India and CYSD (2017)

diversified livelihood portfolio, especially for those dependent on fisheries.²⁹⁷ Even highly vulnerable coastal districts gained adaptive momentum from indigenous technologies, especially water harvesting structures.

Valantharavai village, Tamil Nadu: Participants in the consultations noted the following adaptation needs: access to reliable location-specific advisories at a lead time interval of 1-2 weeks; increasing access to low-interest formal credit, especially for women to diversify into processing; sustainable market links for small ruminants and poultry; restoration of water bodies/provision of check dams to store rainwater; diversification of women's livelihoods by skills development (non-farm/off-farm enterprises) in tailoring, processing of primary agro-products etc.

Thangachimadam Village, Tamil Nadu: Due to increasing climate risks, fishers expressed specific needs, including (i) Building capacity of women fishers on fish processing and value-added technologies with forward and backward linkages; (ii) Sea safety training to manage climate events such as high waves and currents for small scale fishers; (iii) Alternate employment opportunities through vocational training to the youth.

Odisha: Community members noted the following adaptation needs: awareness on climate change and receiving more climate advisories; delta-control; building capacities for cashew nut cultivation, floriculture; developing mangrove and non-mangrove bio-shield to minimize the impact of coastal storms and sea water inundation; breeding salinity tolerant crop varieties for cultivation. Adaptation priorities where gender concerns can be integrated include livelihood-focused, people-centric integrated watershed development programmes in rain-fed areas vulnerable to climatic variations; and developing water-efficient micro-irrigation methods: individual and community farm ponds.²⁹⁸ Active involvement of women in sustainable forest management is especially important as there is a large tribal population directly dependent on forests, and women mainly collect forest products.²⁹⁹

A5.3 Community consultations conducted during Full Proposal development

A5.3.1 Introduction

A second round of community consultations was carried out in the targeted dryland areas in both India and Sri Lanka during Full Proposal (FP) development, to understand the climate vulnerability and adaptation needs of community members. For consistency, each community received the same set of questions, centring around their livelihoods, perceptions and impacts of climate change, support from external agencies, and adaptation gaps and needs. Wherever possible, these were disaggregated for women, men, female youth, male youth, elderly people, and vulnerable groups. The community consultations during FP development for both countries took the form of focus group discussions (FGDs) in all of the identified districts, which were conducted an integrated part of carrying out several assessments, which have been used to develop the full proposal. The assessments included:

- Assessment of natural habitats, biodiversity and the feasibility of various climate resilient and nutritious crops in the targeted localities, with regard to traditional practices and beliefs
- Mapping of existing schemes and support structures for enhanced livelihoods and agriculture, food security- and their climate responsiveness in the targeted project localities
- Mapping the financial support services in the targeted districts that potentially provide microcredit, savings schemes, crop insurance, etc. in order to mobilize financial investments for climate proofing of livelihoods and village level infrastructures
- Analysis of agromet and hydromet advisories provided and capacities of the communities to translate that into action- the capacity gaps at various levels.
- Participatory Gender Assessment

The FGDs held for the Gender Assessment, as detailed in Annex 1, thus also form an important part of the community consultations conducted for full proposal development.

During full proposal development, the situation with respect to COVID-19 was easier in India than it had been during the development of the CN and eight focus group discussions (FGDs) were held in different localities in Andhra Pradesh, with a total of 94 community members of whom 63 were women; eight FGDs in Odisha with a total of 75 community members of whom 38 were women; and eight FGDs in Tamil Nadu with a total of 72 community members of whom 46 were women. In Sri Lanka, community consultations were complicated by the worsening economic crisis and limited availability of fuel and electricity. Nevertheless, community consultations were carried out with a household survey sample of 300 smallholder famers, of whom 195 were women, including livestock farmers and

²⁹⁷ Ramachandran et al., 2016 'Vulnerability and adaptation assessment a way forward for sustainable sectoral development in the purview of climate variability and change: insights from the coast of Tamil Nadu, India', Int. J. Global Warming, Vol. 10, Nos. 1/2/3, pp.307–331.

²⁹⁸ According to the Odisha State Action Plan on Climate Change (2018-2023),

²⁹⁹ Forest and Environment Department, Government of Odisha (2018)

fishers, across the six districts identified. Wherever possible in both countries, separate FGDs were held for women so that they had sufficient space to voice all of their concerns and priorities. Annex 1 contains additional information on disaggregated climate risks, needs and priorities for women as opposed to those for men.

A5.3.2 Summary of findings of community consultations conducted during Full Proposal development in Sri Lanka

The community consultations and associated assessments indicated that the Dry Zone districts and their smallholder farmers are highly vulnerable to the impacts of climate change. They revealed that the climate is undergoing three major types of changes: gradual increase in air temperature; changes in rainfall; and increase in frequency and severity of extreme weather events such as droughts, floods, and winds with slight variations across the districts in general. The climate change impacts pose considerable threats and badly affect agricultural production of smallholder farmers and thereby their livelihoods across the six study districts, with insignificant variations across the districts. However, some farmers are most affected by droughts than other impacts they experience, while others struggle more with the impacts of excessive rainfall that causes floods, and/or crop damage by wild animals.

Smallholder farmers are severely impacted by low adaptive capacities, including a lack of access to knowledge, climate information, food security, skills, depleting biodiversity due to deforestation, agricultural implements and assets, and agricultural extension services. The majority of farmers across all districts still use traditional/local and indigenous knowledge and information for agricultural activities rather than technical or new knowledge received from institutions. It was noteworthy that younger farmers /youth tend to use a blend of traditional and new knowledge for farming activities, while the older generation of farmers tend to rely on traditional and indigenous knowledge and their long experience as farmers. The consultations found that the above factors further increase the vulnerability of smallholder farmers to climate change and impede adaptation measures; women and differently-abled persons in the farmer families in particular lack access to the skills and assets needed for adaptation.

Across all six districts, approximately 92% of families is engaged in agriculture/crop cultivation as their major source of income with formal salaried employment being low. Thus across all six districts a large proportion of the smallholder farmers are either already vulnerable or likely to become vulnerable to climate change impacts. The majority (68%) of smallholder farmers was of the view that they do not receive much support from Government social welfare schemes. This perception was largely observed in farmers in Monaragala and Kurunegala districts while in Mullaitivu, Mannar, Trincomalee and Vavuniya districts the farmers' perception was more positive, expressing the view that they receive assistance from Government social welfare schemes and Samurdhi schemes.

The FGDs conducted in the six districts supplemented by the available literature on financial / credit support services suggest a comparable situation with regard to credit support. The majority of farmers across the districts noted few barriers in accessing the available Government sponsored social and welfare schemes, while political influence and limited infrastructure have been the barriers for accessing such support schemes for other farmers. It was noted that majority of farmers only in Mullaitivu district (70%) has changed their agricultural production practices based on the change in climate and the practices were the shifting to different types of crops or animals, shifting to climate-resilient crops, increased use of chemical fertilizers or pesticides, and incorporation of crop rotation practices.

With regard to household food security, the majority of farmers (94%) in all districts have relied on food produced from their own farms as the primary source of food for the household, with 100% of farmers interviewed in Trincomalee district relying on own production. The practice of purchasing food from the market was at a relatively lower level and limited to essential items like bread, sugar, powdered milk, etc. With regards to the strategies adopted to cope with and ensure household food security, farmers in all districts relied on less preferred/ less expensive food, borrowed food or relying on help from friends or relatives, reducing the number of meals eaten per day, reducing portion size of meals, reducing the quantities consumed by adults/ mothers to ensure food security of young children etc., with some variations across districts. It was also noted that on average around 20% of farmer families has a reliance on these strategies, particularly the reduction of quantity of food consumed by adults in the family to ensure the food security of children.

A substantial percentage of farmers believe that major climate problems that occurred during the last five years are likely to take place in the next five years as well. Regarding the resilience-related capacities in all districts, the majority of households has no anticipatory activities and varying degrees of adaptive capacity and financial capacity.

The measures adopted by smallholder farmers in all districts to cope with and adapt to climate changes in the past five years was not at a high level, with only 40% of the respondents indicating that they had such practices. In Mannar, Mullaitivu, and Vavuniya districts a large number of farmers were found to use such coping capacities and climate adaptation methods; while in Kurunegala, Monaragala and Trincomalee districts a large percentage of farmers does not use such adaptation methods. The most common adaptation methods used by farmers across all districts were

cultivating crops to suit the changing climate conditions, changing seed varieties, shifting to shorter-cycle crop varieties, shifting planting dates, planting drought resistant crop varieties, and planting flood resistant crop varieties.

Around 60% of farmers across all districts does not use any climate change adaptation methods to protect their agriculture and livelihoods from climate change impacts. The reasons provided were lack of financial resources, lack of institutional support, lack of know-how/skills to implement these strategies, and lack of suitable climate resilient crop varieties / seeds. It was noted that the trainings conducted, information and advice provided to farmers in the last year on aspects such as soil health, crop yields, crop losses, water availability, and animal losses were at a low level of around 29%. Thus agricultural extension support was not adequate, according to farmers in all six districts, and was due to a lack of extension officers (DoE and DAD) and resultant irregular visits to farmers.

The agriculture sector still generates livelihood opportunities for a significant part of Sri Lanka's population, especially in rural areas including the smallholder farmers in the six study districts. However, in the face of climate challenges and poor income, some farmers are shifting to other livelihood opportunities. This trend was evident among the youth across the six study districts.

Recommendations for adaptation options made by the farmers to overcome the impacts of climate change on their productivity were for more support to traditional methods of risk management and adaptation that have been developed over generations and are considered cost effective and affordable. These include restoration of the cascade tank systems, appropriate cultivation techniques, climate resilient crop varieties, soil fertility management, natural insect and pest control, integrated crop-livestock systems, and livelihood diversification. The initiatives taken by some key officials to develop micro enterprises to support climate change adaptation – as recorded in Annex 1 in the Gender Assessment, are of an exemplary nature and were thus recommended for replication in the other districts as well for the benefit of smallholder farmers. The opportunity with respect to younger farmers relying on new technology could be capitalized upon to help them to be better equipped to adopt climate adaptation measures with reduced reliance on Government assistance.

A5.3.3 Summary of findings of community consultations conducted during Full Proposal development in India

Socio-economic situation and gender-related findings

Please see Annex 1 (Gender Assessment) and Annex 7 (identification of vulnerable districts) for details of the socio-economic situation and the gender-related findings emanating from the community consultations in India.

Climatic and non-climatic risks to agricultural production – results from community consultations

Focus group discussions (FGDs) were carried out at the village level of the selected districts to understand the agricultural practices, vulnerability to climate and non-climatic factors, and adaptive measures undertaken by smallholder farmers. The villages identified for the FGDs were from districts falling under the dryer climatic zones,³⁰⁰ namely Andhra Pradesh: Anantapur (Arid), Kadapa (Semi-arid); Tamil Nadu: Dharampuri (Semi-arid), Ramanathapuram (Semi-arid); and Odisha: Naupada (Dry sub-humid), Kalahandi (Dry sub-humid).

Villages across the study region of Andhra Pradesh and Tamil Nadu recorded agriculture and livestock rearing as the main livelihoods and agriculture in Odisha. Within the three states, Odisha state exhibits low agricultural productivity. Analysis using secondary data supports this statement regarding low productivity and yield trend. Current studies indicate irrigation plays a decisive role in enabling the farmer to grow crops across multiple seasons and the opportunity to diversify crops. This can be illustrated by comparing villages in Andhra Pradesh and Tamil Nadu, which emerged to have better irrigation systems than villages in Odisha. Villages in Andhra Pradesh and Tamil Nadu have three cropping seasons, namely, kharif, rabi and zaid, while Odisha has only two seasons, kharif and rabi. Villages in Tamil Nadu and Andhra Pradesh exhibit more advanced irrigation systems like drip and sprinkler irrigation besides bore wells and dug wells. In Odisha, canals and streams are the primary sources of irrigation. Farmers from Rundi village in Odisha stated that lack of irrigation limits the cropping season only to kharif. Rabi crops could not be planted because of unavailability of or minimal irrigation systems.

Analysis using secondary crop production statistics indicates the generally positive trend in the productivity of the major crops except in some exceptional cases. However, studies at smaller units like the village level further allow us to assess at a micro-level and give scenarios about the rural landscape. The FGDs indicated crop loss/failure at some point across all villages due to climatic factors, with drought and erratic rainfall being the most prominent in all cases. Untimely rainfall and monsoon failure, especially in kharif season, are contributing to fallow lands. Excessive rainfall is recorded to increase pest attack, thus further affecting productivity. Additionally, prolonged dry spells, heatwaves, and lack of water availability are considered major challenges by the women and men farmers. Besides

³⁰⁰ In which the moisture index value is less than zero in all cases (Raju et al., 2013b)

climate, the decline in groundwater, lack of seeds, and soil fertility due to soil erosion have negatively affected agricultural production and yield growth. Farmers in Andhra Pradesh particularly reported that prolonged dry spells in the early stages of groundnut cropping results in crop failure due to less moisture holding capacity of the soil in the region. They also reported that erratic rainfall and droughts affect production of rainfed maize. The severity of climate impacts on agricultural productivity growth is recorded in the absence of adequate adaptation measures. For example, discussions during the FGD in the Dharmapuri district revealed that farmers still face the challenge of improving yield despite micro-irrigation availability, due to drought and erratic rainfall.

The National Innovations in Climate Resilient Agriculture (NICRA) District Wise Agriculture Contingency Plan documents provide insight on historical occurrences of drought in Andhra Pradesh, Odisha and Tamil Nadu. Approximately 85 per cent of cultivated areas are exposed to droughts (regular or occasional) in Andhra Pradesh. Odisha is highly vulnerable to droughts as all of the thirty districts have experienced drought conditions in the last decade. Similarly, only about 10 per cent of the state is not affected by any form of drought. About 14 districts were reported to have regular drought exposure in Tamil Nadu. A report prepared by Kumar et al. (2019) broadly supports these findings in their state-wise analysis of dry spells. The authors noticed more than five occurrences of 7-day dry spells during kharif season in Andhra Pradesh and Tamil Nadu from 1995-to 2014. The majority of the area in Odisha experienced 7-day dry spells 4 to 5 times in the study period.

In the past and currently, farmers participating in the FGDs have undertaken various adaptation measures to cope with and adapt to these climatic trends, through various development projects, schemes, modern technology and knowledge dissemination. But current interventions and coping capacities remain inadequate, leaving livelihoods and the agricultural system highly vulnerable to climate vulnerability and change. The level of adaptation measures and adaptive capacity across the villages of the three states remains unevenly spread. The absence of various adaptation measures like irrigation limits the opportunities (diversifying crops and growing in non-monsoon season) for the farmer to cope with adverse climate conditions, as in the case of Odisha. Some of the adaptation measures taken by farmers in this region include replacing traditional varieties with high-yield varieties, increasing fertilizer and farmyard manure usage, short-duration crop (paddy and millet), and shifting to vegetables and horticulture crops. In some parts of Tamil Nadu, farmers have shifted from paddy and pulses to short duration vegetables like tomato, radish, brinjal, and lady's fingers even in the kharif season.

Both climatic and non-climatic factors play a crucial role in determining the risk of smallholder farmers' livelihoods and the agriculture sector of the study region. However, the vulnerability of the agriculture system and food security are set by the availability of means for the farmers to adapt. In this context, the means of adaptation refer to reliable irrigation facilities, affordable and accessible good seeds, fertilizers and pesticides, and market facilities. The inadequacy or absence of these measures is prominent in many regions where the FGDs were carried out and demonstrates how the underdeveloped agriculture sector places agricultural populations and those people associated with allied activities highly vulnerable to climate change, especially with respect to food and livelihood security. The climate vulnerability manifests in low productivity coupled with low incomes, leading to unsustainable food and livelihood security.

Potential adaptation options identified

The results of the community consultations, complemented by secondary literature, reveal that food production systems in the project localities are challenged by water stress, long and seasonal droughts, and occasional floods. Appropriate climate adaptation technologies were identified that could result in improved productivity, enhanced resilience and reduced emissions, and would address the interlinked challenges of food production and climate change.

Drought mitigating technologies and practices

- *Pre-monsoon sowing in dry lands* will be useful to offset the soil moisture stress in the areas where the crop growing seasons are narrow with reduced amount of rainfall.
- *Augmenting soil moisture stress mitigating microbes*: The application of AMF biofertilizer is becoming increasingly important for drylands to meet the challenges of severe soil moisture deficits. Intercropping/mixed cropping of deep root legumes and shallow root millets with host specific AMF helps in bioirrigation with the support of common mycorrhizal network between the two crops. Similarly, Methylobacterium, known as pink pigmented facultative methylotrophic bacteria have the ability to deal with soil moisture induced stress in crop production.
- *Improving access to host specific biofertilizers through simple technologies of production*: Despite farmers' awareness on the importance of biofertilizers, the adoption at farm level is constrained by timely availability of products, suitable products for local crops, as well as cost. Thus, decentralised production especially AMF

and *Methylobacterium* improves farmers' access to quality products at low cost and promotes ecosystem-based approach that augments below ground microbial diversity.

- *Improving soil health through cover crops/organic manures/tank silts*: Improving the soil organic matter is interlinked with enhancing soil structure, soil moisture and biological health. Hence promoting suitable cover crops immediately after the main crops supports to build the soil fertility.

Water management technologies

- *Restoring village reservoirs and strengthening in-situ rain water harvesting systems* by harnessing the surface runoff in the through field bunding cum trenches and farm ponds.
- *Adoption of micro irrigation technologies*: efficient use of water can be ensured through adoption of drip irrigation/sprinkler irrigation and other traditional methods like pitcer pot methods, land management technologies around the wide spaced crops/trees etc. Besides, scheduling irrigation at the critical growth stages.
- *Promoting mulching technology*: For vegetable cultivation poly mulching technologies are suggested to reduce the soil evaporation losses there by conserve water, prevents rise in salinity and reduce completion from weeds. Besides, promoting organic mulching through stubbles, straw and other crop residues.
- *Lining of canals or use of foldable plastic pipes*: Helps to reduce the seepage losses and thus improves the water conveyance efficiency in the fields.

Cropping systems

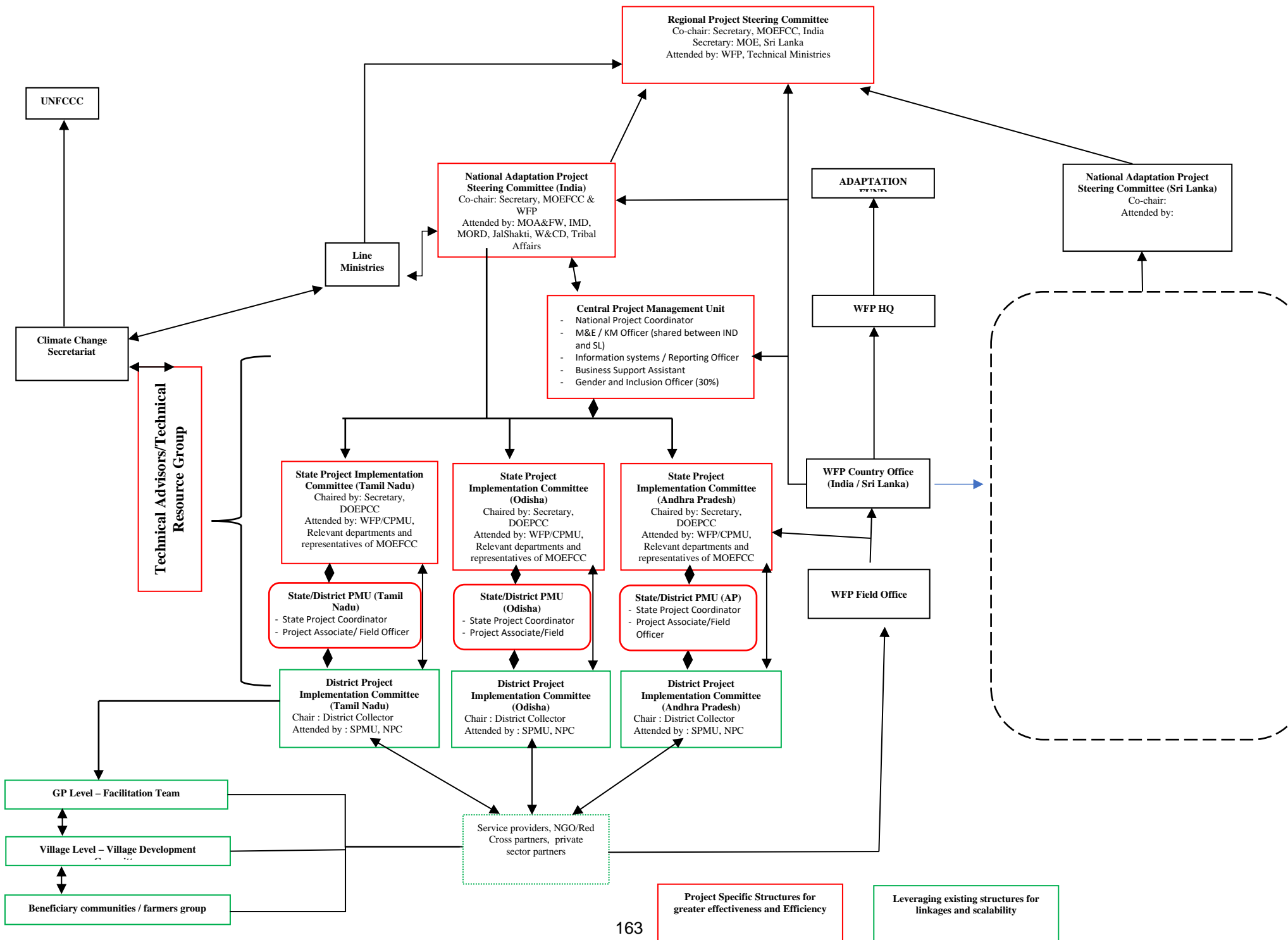
- *Diversifying the cropping systems with agro-forestry/ dry land horticulture/agri-horti-silvi pasture systems* to improve the systems productivity and improve the soil ecosystems.
- *Promoting integrated farming system* with suitable allied enterprises like goat, poultry, agro-forestry, intercropping with long duration legumes etc
- Relay cropping: Planting of next crops using the residual soil moisture of the standing crops towards the mid or end phase of the crop growth.
- *Alternate wetting and drying (AWD) technology in paddy*: It is an efficient water-saving technology helps to reduce irrigation water requirement in rice fields without affecting productivity. In this method, irrigation water is applied a few days after the disappearance of the standing water in paddy fields. Thus, the field receive alternate flooded and non-flooded conditions.
- *Direct seeded rice (DSR) or semi dry paddy cultivation method*: DSR is a potential technology to offset the CH₄ emission as it uses less water during initial crop establishment period. Also it comes to harvest two weeks earlier compared to transplanted one.

Agronomic practices

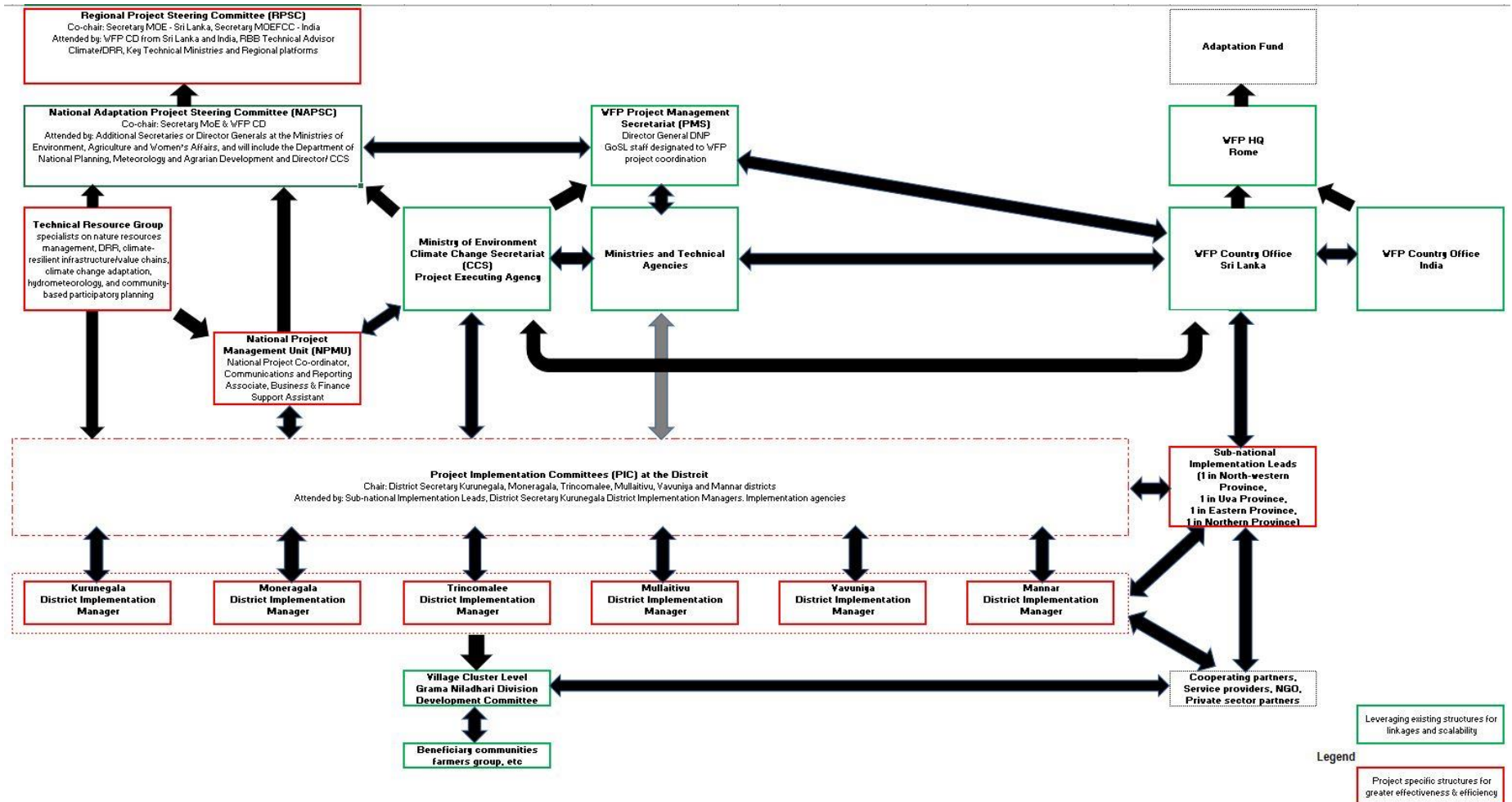
- *Strengthening the selection and access to suitable short duration varieties of seeds* through innovative methods such as participatory varietal selection and community-based seed systems
- *Plant clinics*: Harnessing the digital tools for accessing timely plant health information and climate information services by organizing the plant clinics during the peak cropping season and providing site specific agro-advisories to take informed decisions in dealing with climate risks
- *Field-based crop insurance services harnessing digital technologies covering both biotic and abiotic risks*: The picture-based monitoring of crop phenology to extend necessary advisory support and field based insurance services to improve agricultural risk management was initiated.
- *Augmenting pollination services*: Changes in the weeds and other biodiversity affects the pollinators and can be enhanced through augmenting sources through intercropping and border cropping with suitable species.

Annex 6 Detailed project organograms with sub-national execution arrangements

Annex 6.1 Detailed project organogram for India



Annex 6.2 Detailed project organogram for Sri Lanka



Annex 7 Identification of vulnerable districts in Sri Lanka and India

A7.1 Vulnerability assessment and prioritisation of districts in both countries

Each country identified a limited number of the most vulnerable districts upon which implementation will be concentrated, to maximise impact on the ground. The vulnerability criteria used encompassed climate risk (increasing temperatures, prone to frequent and severe droughts along with high evapotranspiration, low annual rainfall as well as high rainfall variability during monsoons, etc.); socio-economic criteria (poverty levels, gender inequalities, low per capita income and multi-dimensional poverty, income inequality, high levels of food insecurity and malnutrition, limited knowledge on appropriate adaptation measures to address short and long terms impacts of climate change and limited financial capacity to invest in such adaptation measures); environmental criteria (high levels of land degradation, water scarcity, biodiversity threats); and institutional criteria (limited access to targeted climate services, financial services, and social welfare schemes; insufficient extension support; low irrigation coverage and access to infrastructure, etc.). Table 7.1 lists the vulnerable districts identified. This Annex contains further information on the vulnerability assessment process and the proposed project localities. Final decisions on the specific project localities within the targeted vulnerable districts will be decided during the inception stage, based on the above vulnerability criteria and the processes set out below, as well as practical and logistical considerations. Once the specific localities have been identified, consensus will be developed during the community-based participatory planning process on the specific vulnerable individuals to be targeted in each locality.

Table 7.1 Vulnerable districts prioritised for project implementation

Country	SRI LANKA				INDIA		
State/Province	Uva	Northern	Eastern	North-Western	Andhra Pradesh	Odisha	Tamil Nadu ³⁰¹
Prioritised districts	Monaragala	Mullaitivu Vavuniya Mannar	Trincomalee	Kurunegala	Kadapa ³⁰²	Nuapada	Ramanathapuram Dharmapuri

All districts selected in Sri Lanka lie within the Dry zone, except for Kurunegala, which encompasses both Dry and Intermediate zones; the northern part of the district falls within the Dry zone and will be the focus of project activities. In India, all the identified districts lie within dryland areas.

In Sri Lanka, the smallholder farmers in the dry zone districts identified are highly vulnerable to the impacts of climate change, which they are currently experiencing in three main ways: gradual increase in air temperature, increase rainfall variability, and increase in frequency and severity of extreme weather events such as droughts, floods, and winds, with slight variations across the districts. Approximately 92 percent of families/HH members is engaged in agriculture as their major source of income. Employment levels are low, with some people earning their income as salaried employees while a few receive some amounts from Government welfare assistance schemes. Only 40 percent of smallholder farmers in all districts has adopted adaptation measures. Mannar, Mullaitivu and Vavuniya districts included the largest number of farmers using coping and climate adaptation methods while in Kurunegala, Monaragala and Trincomalee districts a large percentage of farmers does not use such adaptation methods.³⁰³ Paddy rice was found to be the major crop cultivated across the districts during both seasons followed by vegetables, pulses and grains, with fruit cultivation at a lower level. Paddy is not cultivated as a perennial crop in all districts but other field crops (pulses, grains) such as maize, cowpea, green gram, ground nuts etc. (coconut predominantly in Kurunegala district) are cultivated across all districts during both seasons. Most farmers have livestock, mainly in small numbers, e.g. 1-10 of poultry and cattle. Savings levels are in general low and farmers lack sufficient access to extension services, climate advisories, Government welfare schemes and credit or other financial services. Many women lack access to and ownership of resources like credit, land, and technology, and do not have equitable access to managerial positions.³⁰⁴

Smallholder farmers in the three states in India are already experiencing considerable climate impacts, particularly increasing drought and heat, coupled with irregular rainfall. All three targeted states show a significant increasing

³⁰¹ In Tamil Nadu, the focus will be on one district, namely Ramanathapuram, and the district Dharmapuri will be included as a part of scale-up and sustainability gradually in the 3rd year of implementation, in consultation with the Executing Entity.

³⁰² The localities will be selected as clusters in these districts at inception stage in consultation with local stakeholders.

³⁰³ Multi Tech Solutions (2022) 'Conducting technical assessments in climate change adaptation to inform the full proposal development'. This study, commissioned by the WFP Sri Lanka Country Office, included a household survey of 300 farmers, from which these statistics and insights are drawn.

³⁰⁴ Gender Assessment carried out in Sri Lanka for this proposal development.

trend in the frequency of dry days during the period 1989-2018.³⁰⁵ The Rayalseema region in Andhra Pradesh includes four districts that are particularly prone to drought conditions. The district of Kadapa in Andhra Pradesh faces high exposure to droughts due to successive failures of the northeast monsoon, combined with uneven rainfall distribution of the southwest monsoon and farmers overexploiting groundwater resources, and is identified, together with Anantapur district, as the strongest heat pocket in the state.³⁰⁶ Tamil Nadu has a highly specific climate in India, referred to as semiarid and tropical monsoon, due to its topographical features and location, and is thus vulnerable to floods, hailstorms, heat waves, drought, thunder and lightning, and forest fires. Ramananthapuram is ranked as the most vulnerable district in Tamil Nadu, with high levels of vulnerability in its inland dryland regions that will be the targeted by the project.³⁰⁷ Millets form the staple food of nearly one-third of the human population of Tamil Nadu. Odisha is one of India's underdeveloped states; drought occurs once in every five years, mostly during the Kharif season and mainly affecting paddy cultivation, the staple crop. Nuapada district is ranked as the third most vulnerable district in Odisha³⁰⁸ and also has a high proportion (33.80 percent) of the tribal population in the district. The cascading effects of droughts on agriculture in the state are reflected in deteriorating nutrition status and out-migration from rural areas. The operational holdings of female farmers across the three states are predominantly less than two hectares, which restricts their marketable surplus. In Odisha only 4.1 percent of women have land in their names which is far below the national average of 14 percent.

A7.2 Rationale for project district selection – Sri Lanka

The vulnerable districts in Sri Lanka for this project were selected using a multi-stage consultation and statistical analysis procedure.

Initially, the process of determining project geographic focus was guided by a comprehensive discussion with experts from the Climate Change Secretariat (of the Ministry of Environment) and relevant domain experts and national agencies, the most recent published data³⁰⁹ from reputable technical experts, government agencies, and WFP's experience managing a portfolio of climate resilience building projects informed by field experience.

The second step involved creating a composite ranking based on the most recent data to be published. Quantitative and qualitative vulnerabilities as well as disciplined investment prospects were considered during the procedure.

For district prioritisation, source information and current information were utilized. In particular, four vulnerability criteria and prospective investment opportunity criteria were used, with varying weights assigned depending on the degree of vulnerability. Climate vulnerability comprises (rising temperatures, susceptible to frequent and severe droughts, high evapotranspiration, low annual rainfall, high rainfall variability during monsoons, etc.), socio-economic vulnerability (food security), environmental vulnerability (irrigation capacity, future projected risk (rainfall anomaly), and institutional vulnerability (currently functioning projects and investments).

Climate vulnerability and food security rankings have been assigned criteria weights, but future potential and climate risk areas criteria have been assigned the lowest criteria weights because this information was unavailable during the secondary data review and expert consultation phase.

The selected project districts were presented to the National Steering Committee on Climate Change Adaptation, Ministry of Environment, Government of Sri Lanka for final approval based on this analysis and consultations.

A7.3 Prioritisation of vulnerable districts – India

A7.3.1 Methodology for Identification of key vulnerable districts in India

Identification of most vulnerable regions based on key climate drivers and other socio-economic conditions including gender assessment is a vital step in prioritizing the implementation of key climate actions for climate-resilient adaptation. The literature on vulnerability is continually evolving and looks at complex interactions and feedback loops among various social and ecological systems, along with the hazards associated with climate change. Capturing all of these in quantitative assessments is a challenging task. Quantitative assessments, therefore, aim to have simplified representations of these complex interactions through the use of indicators within a basic framework

³⁰⁵ MoEFCC (2021) Third Biennial Update to the UNFCCC

³⁰⁶ Andhra Pradesh State Action Plan for Climate Change (2012)

³⁰⁷ Rama Rao, C.A., Raju, B.M.K., Islam, A., Subba Rao, A.V.M., Rao, K.V., Ravindra Chary, G., Nagarjuna Kumar, R., Prabhakar, M., Sammi Reddy, K., Bhaskar, S. and Chaudhari, S.K. (2019). Risk and Vulnerability Assessment of Indian Agriculture to Climate Change, ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, P.124. Hereafter referred to as NICRA-ICAR 2019.

³⁰⁸ NICRA-ICAR 2019.

³⁰⁹ Food security: Household Income and Expenditure Survey (HIES) 2019, Bureau of Statistics; Sri Lanka's regional exposure to climate change (Source: Punyawardena et al. 2013a); Future projected risk and future investments: Expertise guided by the Climate Change Secretariat.

that captures the main sources of vulnerability. However, the meaning of vulnerability itself has been the source of major debate and the literature has seen wide divergence on the subject.

Up until AR5 of the IPCC, the framework of the AR4 report had vulnerability as a key outcome indicator. It was seen as the susceptibility to harm, after having taken account of the capacity to adapt, multiplied by the potential impact of a hazard (which in turn was the product of exposure and sensitivity). However, a major paradigm shift was made by the Fifth Assessment Report (AR5)³¹⁰ of the Intergovernmental Panel on Climate Change that shifted the focus from vulnerability to risk. In this framework, risk is the product of exposure, hazard and vulnerability. This framework has not changed between AR5 and AR6.

A vulnerability and adaptation assessment study was conducted focusing on adaptation-related initiatives in three vulnerable states of India – Andhra Pradesh, Odisha and Tamil Nadu, to strengthen the resilience of vulnerable communities in these three states to increased impacts of climate change. The identification of the most vulnerable regions and districts in these states was a key initial step. Three sources were extensively examined for this: (i) the National Innovations in Climate Resilient Agriculture (NICRA) – Indian Council of Agricultural Research (ICAR) 2019 report titled '*Risk and Vulnerability Assessment of Indian Agriculture to Climate Change*'³¹¹ (hereafter NICRA-ICAR 2019 vulnerability report); (ii) the Department of Science and Technology 2019-2020 report titled '*Climate Vulnerability Assessment for Adaptation Planning in India Using a Common Framework*'³¹² (hereafter DST 2019-20 vulnerability report); and (iii) composite vulnerability indices from the State Action Plans on Climate Change (SAPCCs) of the three states and a few key relevant research papers.

The vulnerability framework outlined in the project concept³¹³ as well as in the technical proposal submitted emphasizes inland dry regions of the eastern coastal states of Odisha, Andhra Pradesh and Tamil Nadu that are prone to frequent and severe droughts along with high evapotranspiration, low annual rainfall as well as high rainfall variability during monsoons. In addition to this, the project also outlines other key indicators of vulnerability and related socio-economic characteristics such as low irrigation coverage, gender inequalities, low per capita income and multi-dimensional poverty, income inequality, high levels of food insecurity and malnutrition, low literacy levels in terms of limited knowledge to adaptation on adequate measures to address short and long terms impacts of climate change and limited financial capacity to invest in such adaptation measures. Several of these indicators of vulnerability, though not all, outlined in the project concept are well captured in the NICRA-ICAR 2019 vulnerability report. The NICRA-ICAR 2019 vulnerability ranking focuses on relevant indicators (with % weightage), namely net irrigated area (20%), annual rainfall (12%), groundwater availability (10%), available water holding capacity of soil (8%), income (3%), income inequity (8%), gender gap (3%), self-help groups (3%), literacy (3%), and a few others, based on differential weightage (See Table 1). Again, the indicators adopted in NICRA-ICAR 2019 such as 'area under degraded and waste land', 'available water holding capacity (AWC) of soil' and 'groundwater availability' are reflective of the ecosystem-based assessment of vulnerability in terms of sensitivity and adaptive capacity of the region (See Table 1). Moreover, the NICRA-ICAR 2019 vulnerability assessment has an added advantage of climate indicator (in terms of annual rainfall) which is a universal reflective indicator for drought and dryness for a region. Further, the NICRA-ICAR report it is clear follows the AR5 framework rather carefully, in also developing the climate hazard and exposure indices.

Turning to indicators outlined in the DST 2019-20 vulnerability report, they are superficially aligned to the required project concept as the district-level vulnerability assessment in the report also looks into institutional and infrastructure aspects including health and sanitation in addition to agriculture, livelihood and other biophysical aspects of vulnerability. DST-2019 uses equal weightage allocation whereas NICRA-ICAR 2019 uses differential weightage with relatively higher weightage to key indicators that are reflective of dryness and drought-like conditions of a region as well as agriculture related vulnerability to climate change, namely – annual rainfall (12%), net irrigated area (20%) and groundwater availability (10%).

There are however serious issues with the DST-2019 report. First, there is an issue of homogeneity in the DST-2019 vulnerability assessment as a few of the indicators listed under the 'socio-economic and livelihood based' category

³¹⁰ IPCC, 2014: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp.

³¹¹ Rama Rao, C.A., Raju, B.M.K., Islam, A., Subba Rao, A.V.M., Rao, K.V., Ravindra Chary, G., Nagarjuna Kumar, R., Prabhakar, M., Sammi Reddy, K., Bhaskar, S. and Chaudhari, S.K. (2019). Risk and Vulnerability Assessment of Indian Agriculture to Climate Change, ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, P.124.

³¹² Department of Science and Technology. (2019-2020). Climate Vulnerability Assessment for Adaptation Planning in India Using a Common Framework. [Website: <https://dst.gov.in/sites/default/files/Full%20Report%20%281%29.pdf>]

³¹³ Project Concept (Endorsed) [<https://www.adaptation-fund.org/projects-document-view/?URL=en/931761634917660286/13441-WFP-Regional-CN-Sri-Lanka-India-08-Sep-21-Final.pdf>]

is not being considered in these 3 states due to the non-availability of data and this can be observed for the states of Odisha and Andhra Pradesh.

Further, the district wise vulnerability ranking in Part II of the report, based on an all-India ranking of all districts within the country has a ranking of districts within Odisha, Andhra Pradesh and Tamil Nadu that differs significantly from the State-level vulnerability assessment in Part III of the report. Some instances of this are as follows:

- For AP, the district Anantapur, is out of the top 10 in the all-India district list. However, its rank is 6 in Part-III within the AP ranking.
- For Odisha, the districts of Gajapat, Kalahandi, Kandhamal and Rayagada are out of the top 10 in the all-India district list. However, their respective rankings in Part-III within the Odisha state are 3, 4, 5 and 6 respectively.
- For TN, the district Dharmapuri is out of the top 10 in the all-India district list. However, its rank was 3 in Part-III within the TN ranking.

Finally, the most significant issue is that the list of indicators in the DST list clearly follow the AR4 framework, despite the reference to the AR5 risk framework in the initial discussion. The indicators conflate both outcome indicators of risk (such as yield variability of food grains), and adaptive capacity indicators such as area covered by insurance, or health infrastructure. This is in contrast to the NICRA-ICAR indicators that are far more rigorously formulated, despite the fact that one or two more indicators would have been welcome. The table below shows the list of indicators:

NICRA-ICAR 2019	DST 2019
<i>Vulnerability Indicator List (Differential % weightage)</i> [All India District-level vulnerability indicators list – 15 indicators]	<i>Vulnerability Indicator List (Equal weightage)</i> [All India District-level vulnerability indicators list – Part II of DST-2019]
<u>Climate indicators:</u> 1) Annual Rainfall (12%)	<u>Climate indicators:</u> Note: No Climate Indicators taken
<u>Socio-economic and livelihood-based indicators:</u> 2) Per capita Income (4%) 3) Income inequity (8%) 4) Livestock density (8%) 5) Literacy (3%) 6) Gender Gap (3%)	<u>Socio-economic and livelihood-based indicators:</u> 1) Percentage of households having monthly income of highest earning members less than Rs. 5,000/- in the rural area 2) Livestock to human ratio 3) Proportion of marginal and small landholders 4) Women's participation in the workforce 5) Percentage of net sown area under horticulture 6) Female literacy rate
<u>Biophysical indicators:</u> 7) Area under degraded and waste land (5%) 8) Available water holding capacity (AWC) of soil (8%) 9) Groundwater availability (10%) 10) Net Irrigated Area (20%) 11) Fertilizer Use (5%)	<u>Biophysical indicators:</u> 7) Yield variability of food grains 8) Proportion of area under rainfed agriculture 9) Forest area per 100 rural population
<u>Institution and infrastructure related indicators:</u> 12) Road connectivity (4%) 13) Self-help groups (3%) 14) Rural electrification (3%) 15) Market density (4%)	<u>Institution and infrastructure related indicators:</u> 10) Road density 11) Area covered under centrally funded crop insurance schemes (PMFBY and RWBCIS) 12) MGNREGA 13) Health infrastructure per 1000 population

14) Percentage of households with an improved drinking water source.
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Thus, it was determined that the NICRA-ICAR 2019 vulnerability assessment had more proximity to the required vulnerability framework outlined for the proposed regional AF project; hence, the NICRA-ICAR 2019 vulnerability ranking was adopted as the base indicator. The other vulnerability document sources as mentioned earlier, namely the DST 2019-20 vulnerability report and other composite vulnerability indices from the SAPCCs of the three states as well as other key relevant research publications would provide additional support in identifying the key vulnerable districts/regions in these three states. Though the nutritional aspect is not covered here in the district level vulnerability framework in either of the two indicators listed above (NICRA & DST), it would be covered in the state-level assessment. Consequently, the choices of district identification were mostly dictated by NICRA-ICAR 2019 ranking, further supported by the other two key sources of vulnerability rankings, namely DST 2019-20 vulnerability ranking and other composite vulnerability indices from SAPCCs of the respective states or other key relevant research publications, with the added condition that they must preferably appear in the top 10 in the other two.

A7.3.2 Identification of Key Vulnerable districts By States

Using the methodology developed above, the key vulnerable districts for each state were identified. The table below summarizes the districts identified using the methodology discussed above, followed by a summary of the process followed for each state. Subsequent to this vulnerability identification, the MoEFCC further prioritised four districts out of the original six identified, based on the same criteria as well as the need to concentrate project resources in a smaller number of districts for maximum impact. The final four prioritised districts were Kadapa in Andhra Pradesh, Nuapada in Odisha, and Ramananthapuram and Dharmapuri in Tamil Nadu.

State	Districts selected	Block/Mandal	Potential Identified Villages
Andhra Pradesh	1. Ananthapur	Talupala mandal	1.Vepamanupeta (Dry) 2.Idulakuntlapalli (Dry) 3. Pulligilapalli (wet)
	2. Kadappa	Rayachoty mandal	1.Katamayakunta (dry) 2.Madhavaram (dry) 3.Gorlamudhivedu (wet)
Odisha	1. Kalahandi	1. Thuamul Rampur 2. Junagarh	1. Sundhi Juba (Thuamul Rampur block; dry area) 2. Michasola (Junagarh block; dry area) 3. Padandei (Junagarh block; wet area)
	2. Nuapada	1. Boden 2. Khariar	1. Rundi (Boden block; dry area) 2. Bhainsadani (Boden block; partly irrigated area) 3. Tikhali (Khariar block; irrigated area) 4. Bargaon (Khariar block; irrigated area)
Tamil Nadu	1. Dharmapuri	1.Pennagaram 2. Palakode	1.Kalappambadi (Pennagaram) 2. Hanumanthapuram (Palakode)
	2. Ramanathapuram	1.Kamudi 2. Thiruvadana	1. Puthukottai (Kamudi) 2. Natham (Kamudi) 3. Nambuthalai (Thiruvadana) 4. Kodipangu (Thiruvadana)

A7.3.2.1 Andhra Pradesh

Most vulnerable districts of Andhra Pradesh

Historically, Andhra Pradesh has been prone to drought conditions (especially the Rayalaseema region) and has been the third-highest drought-prone state after Rajasthan and Karnataka. Andhra Pradesh State Action Plan for

Climate Change (APSAPCC 2012)³¹⁴ conceptualizes vulnerability of an environmental and socio-economic system as a function of exposure of that system to effects of climate change and the adaptive capacity to deal with those effects. Based on these parameters, the report concluded that some districts like Anantapur, Chittoor, and Kadapa face high exposure to droughts. Projected surface-air-temperatures over the Rayalaseema region have ranged from 26.5° to 30°C for the 2020s, 28° to 31.5°C for the 2050s, and 29.5° to 32.5°C for the 2080s. Within the Rayalaseema district, Anantapur and Kadapa districts are identified as the strongest heat pockets (APSAPCC, 2012). Dryland areas (parts of Anantapur, Kurnool, Kadapa, Prakasam) exist in the state where annual rainfall is less than 550 mm and rainfed farming faces considerable stress.

The frequency of droughts has increased over the years, particularly in the Anantapur district which witnessed 17 drought years in the past 4 decades (Singh et. al., 2012)³¹⁵. The district has been drought-prone for more than a century with the situation getting worse due to prolonged rainfall deficit in the past few decades. This makes it one of the most drought-affected districts in Southern India (Down to Earth, 2019)³¹⁶. The strain on water resources in the state has been rising consistently due to huge demand from agriculture, industry and urban centres with adverse impact on farmers, agricultural labourers and rural population in dry-land rainfed areas (World Bank, 2006)³¹⁷.

Rao *et al.* (2017)³¹⁸ have developed a vulnerability index for the state of Andhra Pradesh, based on parameters of exposure, sensitivity, and adaptive capacity. Broadly, indicators include variability in rainfall, temperature, proneness to natural calamities such as droughts, floods, cyclones and rural population density. Under the vulnerability parameter, Anantapur, Chittoor, Kurnool, Kadapa, and Prakasam are ranked top 5, in that order.

The DST 2019-20 vulnerability report presents a vulnerability index based on 12 socio-economic indicators. According to this report, the major drivers of vulnerability for the state of Andhra Pradesh were - large proportion of marginal and small farmers in the agricultural sector, lack of forest area per 1000 population, lack of implementation of centrally funded crop insurance policies, low road density, and a lack of health infrastructure. Based on these parameters, the most vulnerable districts in Andhra Pradesh identified are Chittoor, Krishna, Prakasam, Anantapur, Visakhapatnam, West Godavari, Kurnool, and Kadapa.

The NICRA-ICAR 2019 vulnerability report analyses the risks faced by states based on three dimensions, namely hazard, exposure, and vulnerability. Exposure indicators mainly include net sown area, rural population density, small and marginal farmers, SC/ST population, and cross-bred cattle. Vulnerability indicators include annual rainfall, net irrigated area, groundwater availability, livestock population, literacy, gender gap, income inequality, road connectivity etc. In the NICRA report, hazard refers to the occurrence of a climate shock in the context of climate change. In the analysis, the dimension of hazard was represented in two forms: future climate hazard and historic hazard. These include indicators such as drought proneness, flood proneness, cyclone proneness, dry spells, heat waves etc. Based on NICRA's analysis, the top five most vulnerable districts in Andhra Pradesh are Anantapur, Kadapa, Kurnool, Prakasam, and Chittoor (See Table). We will use this as the base list for ranking as the criteria appear to be the most aligned to the project objectives.

The state of Andhra Pradesh has around 5.5% of Scheduled Tribe population and most of these tribal populations are concentrated in coastal districts of the state (Tribal Welfare Department, Government of Andhra Pradesh)³¹⁹. The major tribal-dominated districts in the state are Visakhapatnam (14.86%), Vizianagaram (10.05%), Nellore (9.65%), Srikakulam (6.15%), East Godavari (5.62%), Guntur (5.06%) and Prakasam (4.45%) (Ibid). The interior districts of the Rayalaseema region have a relatively low tribal population - Anantapur (3.78%), YSR (Kadapa) (2.63%), Kurnool (2.04%), and Chittoor (3.81%) (Ibid).

Table A7.3.2.1.a Most vulnerable districts of Andhra Pradesh

Rank	NICRA Ranking [Overall Vulnerability] 2019	DST Ranking 2019 [Overall Vulnerability]	Rama Rao et al., 2017 Ranking**
1	Anantapur	Chittoor	Anantapur
2	YSR (Kadapa)	Krishna	Chittoor

³¹⁴ Andhra Pradesh State Action Plan on Climate Change. (2012). [Website: <https://moef.gov.in/wp-content/uploads/2017/08/Andhra-pradesh.pdf>]

³¹⁵ Singh et al. (2012), "Climate Change Realities and Policy Coherence in SAT India", ICRISAT, Policy Brief No. 17 [website source: <http://oar.icrisat.org/5935/1/Policy%20Brief%2017.pdf>]

³¹⁶ Down to Earth, G Ram Mohan, "Drought, but why: Area under cultivation has halved in Andhra Pradesh's Ananthapuramu" 25 February 2019.

³¹⁷ World Bank (2006). Overcoming Drought: Adaptation Strategies for Andhra Pradesh. [<https://elibrary.worldbank.org/doi/abs/10.1596/978-0-8213-6664-6>]

³¹⁸ Rao, C. A. R., Raju, B. M. K., Rao, A. V. M. S., Rao, K. V., Samuel, J., Ramachandran, K., Nagasree, K., Kumar, R. N., & Shankar, K. R. (2017). Assessing vulnerability and adaptation of agriculture to Climate change in Andhra Pradesh. *Indian Journal of Agricultural Economics*. <https://doi.org/10.22004/ag.econ.302273>

³¹⁹ Website of Tribal Welfare Department, Government of Andhra Pradesh. [<https://aptribes.gov.in/pdfs/table2.pdf>]

3	Kurnool	Nellore	Kurnool
4	Prakasam	Prakasam	Kadapa
5	Chittoor	Srikakulam	Prakasam
6	Visakhapatnam	Anantapur	Guntur
7	Vizianagaram	Visakhapatnam	Nellore
8	Srikakulam	West Godavari	Srikakulam
9	East Godavari	Kurnool	Visakhapatnam
10	Nellore	Guntur	East Godavari

Note: **Rama Rao et.al., 2017 mostly focuses on Vulnerability of Agriculture to Climate Change in Andhra Pradesh

Table A7.3.2.1.b Nutritional Status as per NFHS-5 for most vulnerable districts in Andhra Pradesh

Table 2b: Nutritional Status as per NFHS-5 for most vulnerable districts of Andhra Pradesh (All values are in per cent)		
NFHS-5 (2019-21)	Nutritional Status of Children	Anaemia among Women
Districts	Stunted Children under 5 years (height-for-age)* (%)	All women age 15-49 years who are anaemic*** (%)
Anantapur	36.0	50.5
YSR (Kadapa)	34.4	56.1
Kurnool	50.5	58.6
Prakasam	22.6	60.4
Chittoor	27.1	51.8
Visakhapatnam	31.0	58
Vizianagaram	36.4	64
Srikakulam	19.7	62.6
East Godavari	23.1	63
Nellore	29.2	59.4
AP state average	23.1	57.8
All India average	35.5	57

Data Source: NFHS-5 (2019-21) State and District Fact Sheet Compendiums [http://rchiips.org/nfhs/NFHS-5_FCTS/COMPENDIUM/Andhra_Pradesh.pdf]

Note:
 * Below -2 standard deviations, based on the WHO standard.
 ** Excludes pregnant women and women with a birth in the preceding 2 months.
 *** Haemoglobin in grams per decilitre (g/dl). Among children, prevalence is adjusted for altitude. Among women, prevalence is adjusted for altitude and for smoking status, if known. As NFHS uses the capillary blood for estimation of anaemia, the results of NFHS-5 need not be compared with other surveys using venous blood.

Note: The ten most vulnerable district listed above here in table is as per NICRA 2019 list in table earlier.

Nutritional status for most vulnerable districts of Andhra Pradesh:

It is evident from the table above that the nutritional indicator values for stunted children and anaemic women for most of the vulnerable districts listed above are more than the state average corresponding values (**a higher indicator % value means more vulnerable**). Kurnool with 50.5% was being observed considerably higher than the state and national averages on stunting parameters followed by Vizianagaram (36.4%) and Anantapur (36%). All the vulnerable districts listed in table 2b except Prakasam, Srikakulam and East Godavari were found to be more than

the state average on stunting parameters. Coming to anaemic women indicator criteria, except three districts (Anantapur, YSR(Kadapa) and Chittoor), values for the rest of the seven out of ten listed districts were found to be above the state as well as the national average values. District Vizianagaram with 64% women (age 15-49 years) being anaemic was found to be the most vulnerable followed by East Godavari (63%), Srikakulam (62.6%), Prakasam (60.4%), Nellore (59.4%), Kurnool (58.6%) and Visakhapatnam (58%), all districts being above the state and national average values.

Key vulnerable districts identified for Andhra Pradesh

Based on the literature presented and Table 2a & 2b above, we can qualitatively corroborate that in Andhra Pradesh, districts Anantapur, Kadapa, Kurnool, and Chittoor are found most vulnerable, out of which we select Anantapur and YSR (Kadapa) districts for our study. These selected dry regions/districts have no significant tribal population, the vulnerability assessment of these communities is not a point of emphasis at the district level. However, the State level analysis will pay attention to the vulnerability of the tribal population. As stated earlier, this choice is dictated basically by the NICRA list. We are not indicating a further differentiation in ranking and would be guided by other considerations (including State Govt consultations) for the actual detailed study.

A7.3.2.2 Odisha

Most vulnerable districts of Odisha

The DST 2019-20 vulnerability report uses nine indicators to assess the district-wise vulnerability in the state of Odisha, out of which four major indicators, namely - lack of area under crop insurance, rainfed agriculture, lack of forest area per 1000 rural population and lack of health infrastructure, were the key indicating drivers of vulnerability. It was found that 7 out of 30 districts of the state were found to be under the category of relatively-high vulnerable [Vulnerability Indices (VIs) ranging from 0.62–0.73] with Malkangiri district (0.73) as the most vulnerable district followed by Nayagarh (0.64), Gajapati (0.64), Kalahandi (0.64), Kandhamal (0.63), Rayagada (0.63), and Koraput (0.62).

As per the NICRA-ICAR 2019 vulnerability report, Malkangiri district is the most vulnerable district in terms of overall vulnerability. Other districts that follow are Nabarangpur, Nuapada, Gajapati, Rayagada, Kandhamal, Bolangir, Deogarh, Kalahandi & Koraput. Other pieces of literature highlight the coastal vulnerability in the state, mostly in the context of coastal calamities and extremes. Patnaik et.al, 2013³²⁰, shows that Kendrapara is the most vulnerable coastal district of Odisha for the year 2011 followed by Jagatsinghpur, Puri, Balasore and Bhadrak. Patnaik & Narayanan (2009), highlights that Dhenkanal remains the most vulnerable coastal district historically. Other coastal districts that follow are Balasore, Puri, Ganjam and Cuttack. These are the districts that were affected areas due to tropical cyclones and storms in the year 1991.

Coming to the drought situation in the state, around 70 per cent of the total cultivable area in the state is prone to droughts, with Bolangir and Boudh being the most drought-affected districts, historically (OSAPCC 2018-2023). A study by Panda et al., 2017³²¹, highlights that the three backwards districts of Odisha in the southwestern part, namely, Kalahandi, Bolangir, and Koraput were found to have become more vulnerable in recent years due to recurring drought-like conditions and that in turn have led to distress temporary out-migration from these rural areas in non-agricultural season. These three districts have observed a significant reduction in crop yield due to climate variability, primarily driven by rainfall variability. Other chronic drought-prone districts that are identified by the government are Bargarh, Nuapada, Kalahandi and Phulbani (SDMC, OSDMA).

Based on the literature reviewed above, a consolidated vulnerability table for various districts of Odisha as per various indicators and sources has been listed out as shown in Table below.

Table A7.3.2.2a Most vulnerable districts of Odisha

Most vulnerable districts of Odisha
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³²⁰ Patnaik, U., Das, P. K., & Bahinipati, C. S. (2013). Analyzing Vulnerability to Climatic Variability and Extremes in the Coastal Districts of Odisha, India. *Review of Development and Change*. <https://doi.org/10.1177/0972266120130206>

³²¹ Panda, A., Sahu, N., Behera, S., Sayama, T., Sahu, L., Avtar, R., Singh, R. B., & Yamada, M. (2019). Impact of climate variability on crop yield in Kalahandi, Bolangir, and Koraput districts of Odisha, India. *Climate*. <https://doi.org/10.3390/cli7110126>

Vulnerability Rank	NICRA Ranking (2019) [Overall Vulnerability]	DST Ranking (2019) [Overall Vulnerability]	Patnaik et al., 2013* (2011 Rank) [Coastal Vulnerability]	Patnaik & Narayanan, 2009* (1991 Rank) [Coastal Vulnerability]
1	Malkangiri	Malkhangiri	Kendrapara	Dhenkanal
2	Nabarangpur	Nayagarh	Jagatsinghpur	Balasore
3	Nuapada	Gajapati	Puri	Puri
4	Gajapati	Kalahandi	Balasore	Ganjam
5	Rayagada	Kandhamal	Bhadrak	Cuttack
6	Kandhamal	Rayagada	-	-
7	Bolangir	Koraput	-	-
8	Deogarh	Nabarangpur	-	-
9	Kalahandi	Angul	-	-
10	Koraput	Deogarh	-	-

Note: * Patnaik et al., 2013 and Patnaik & Narayanan, 2009 focuses on only coastal vulnerability

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Table A7.3.2.2b Nutritional Status as per NFHS-5 for most vulnerable districts in Odisha

Table 3b: Nutritional Status as per NFHS-5 for most vulnerable districts of Odisha (All values are in per cent)		
NFHS-5 (2019-21)	Nutritional Status of Children	Anaemia among Women
Districts	Stunted Children under 5 years (height-for-age)* (%)	All women age 15-49 years who are anaemic*** (%)
Malkangiri	44.3	71.9
Nabarangpur	44.1	69.3
Nuapada	43.1	64.0
Gajapati	43.4	66.1
Rayagada	43.6	69.1
Kandhamal	34.2	48.9
Bolangir	32.7	59.4
Deogarh	28.4	72.2
Kalahandi	33.0	64.2
Koraput	43.1	58.2
Odisha state average	31.0	64.3
All India average	35.5	57.0

Data Source: NFHS-5 (2019-21) State and District Fact Sheet Compendiums [http://rchiips.org/nfhs/NFHS-5_FCTS/COMPENDIUM/Odisha.pdf]; [http://rchiips.org/nfhs/NFHS-5_FCTS/Odisha.pdf]

Note:
 * Below -2 standard deviations, based on the WHO standard.
 ** Excludes pregnant women and women with a birth in the preceding 2 months.
 *** Haemoglobin in grams per decilitre (g/dl). Among children, prevalence is adjusted for altitude. Among women, prevalence is adjusted for altitude and for smoking status, if known. As NFHS uses the capillary blood for estimation of anaemia, the results of NFHS-5 need not be compared with other surveys using

Note: The ten most vulnerable district listed above here in table is as per NICRA 2019 list in table earlier.

Nutritional status for most vulnerable districts of Odisha:

As observed in the above table the nutritional value in the state of Odisha is quite worrisome. The nutritional indicator values for stunted children and anaemic women for most of the vulnerable districts listed above are more than the state average corresponding values (**a higher indicator % value means more vulnerable**). Malkangiri with 44.3% and Nabrangpur with 44.1% were being observed considerably higher than the state and national averages on

stunting parameters followed by Rayagada (43.6%), Gajapati (43.4%), Naupada (43.1%), and Koraput (43.1%). All these six mentioned vulnerable districts listed in table 3b except Kandhamal, Bolangir, Deogarh and Kalahandi were found to be more than the state as well as national averages on stunting parameters. Coming to anaemic women indicator criteria, except Kandhamal district, values for the rest of the nine out of ten listed districts were found to be above the national average. Considering the fact that Odisha's state average value for anaemic women is 64.3% which is way above the national average value of 57%, still, five listed vulnerable districts namely – Deogarh, Malkangiri, Nabarangpur, Rayagada and Gajapati were found to be above than the state average and eventually more than the national average as well. District Deogarh with 72.2% women (age 15-49 years) being anaemic was found to be the most vulnerable followed by Malkangiri (71.9 %), Nabarangpur (69.3%), Rayagada (69.1%) and Gajapati (66.1%), all districts being above the state and national average values.

Key vulnerable districts identified for Odisha:

Based on the literature as well as the tables presented above, we can corroborate qualitatively that in the state of Odisha, districts (% ST population³²²) – Malkangiri (57.83%), Nabarangpur (55.79%), Gajapati (54.29%), Rayagada (55.99%), Kandhamal (53.58%), Bolangir (21.05%), Kalahandi (28.50%) & Koraput (50.56%) are the most common top vulnerable districts in terms of overall vulnerability, following the same criteria as earlier. However, as per the recommendation of the state government, Naupada (with ST population 33.80% (Ibid)) and Kalahandi (with ST population 28.50%) districts are considered for the study. Moreover, in terms of vulnerability to drought proneness (SDMC, OSDMA) as well as on the nutritional ground, these two recommended districts are found suitable for the study. All these selected districts in the state have considerably high proportions of tribal population. Hence the vulnerability assessment for the state of Odisha would have a major focus on tribal communities with a special focus on Particularly Vulnerable Tribal Groups (PVTGs).

A7.3.2.3 Tamil Nadu

Most vulnerable districts of Tamil Nadu

Drought, water depletion, soil erosion, seawater incursion, forest fire, species extinction, and thermal discomfort are major evidence of climate change in the area. Tamil Nadu is prone to extreme events like frequent and severe cyclones and droughts. The Draft TNSAPCC 2.0 (Draft, Tamil Nadu State Action Plan for Climate Change – 2.0, Chapter 4)³²³ highlights the district wise vulnerability of the state based on the Composite Vulnerability Index (CVI). This composite index is based on IPCC's working definition of vulnerability as a function of exposure, sensitivity, and adaptive capacity. 63 identified indicators have been used here that has been segregated into adaptive capacity, sensitivity and exposure. Based on this, five sectoral vulnerability indices have been identified - social, economic, climate, water resources, and agriculture. As per the Draft TNSAPCC 2.0, 5 districts, namely Ramananthapuram, Vellore, Viluppuram, Krishnagiri, and Nagapattinam, fall under the *very high vulnerability* category. This is followed by 6 districts under the *high vulnerability* category, namely Dharmapuri, Thoothukkudi, Ariyalur, Cuddalore, Virudhnagar, Sivaganga.

The NICRA-ICAR 2019 vulnerability report ranks Ramananthapuram, Perambalur, Thoothukkudi and Ariyalur as the four most vulnerable districts in Tamil Nadu (see Table below). Ramanathapuram is a coastal district. However, inland regions are also the classic example of dry-land vulnerability for Tamil Nadu, from even before the climate change era and hence may be included in the list.

Table A7.3.2.3a Most vulnerable districts in Tamil Nadu

Most vulnerable districts of Tamil Nadu			
Rank	NICRA Ranking 2019 [Overall Vulnerability]	DST Ranking 2019 [Overall Vulnerability]	TNSAPCC Ranking 2017 (Composite Vulnerability)
1	Ramananthapuram	Ariyalur	Ramananthapuram
2	Perambalur	Perambalur	Vellore
3	The Nilgiris	Dharmapuri	Viluppuram
4	Thoothukkudi	Ramananthapuram	Krishnagiri
5	Ariyalur	Nagapattinam	Nagapattinam
6	Dindigul	Krishnagiri	Dharmapuri

³²² STATISTICAL HAND BOOK OF TRIBAL SUB PLAN (TSP) BLOCKS IN ODISHA, 2014. [<https://tribal.nic.in/repository/ViewDoc.aspx?RepositoryNo=TRI22-08-2017163302&file=Docs/TRI22-08-2017163302.pdf>]

³²³ Draft Tamil Nadu State Action Plan On Climate Change - 2.0. [website source: <https://www.environment.tn.gov.in/tnsapcc-draft>]

7	Dharmapuri	Dindigul	Thoothukudi
8	Karur	Sivaganga	Ariyalur
9	Namakkal	Villupuram	Cuddalore
10	Theni	Theni	Virudhunagar

Table A7.3.2.3b Nutritional Status as per NFHS-5 for most vulnerable districts in Tamil Nadu

Table 4b: Nutritional Status as per NFHS-5 for most vulnerable districts of Tamil Nadu (All values are in per cent)		
NFHS-5 (2019-21)	Nutritional Status of Children	Anaemia among Women
Districts	Stunted Children under 5 years (height-for-age)* (%)	All women age 15-49 years who are anaemic*** (%)
Ramananthapuram	26.4	53.6
Perambalur	29.1	66.1
The Nilgiris	26.7	44.2
Thoothukkudi	20.3	55.9
Ariyalur	25.3	62.4
Dindigul	27.1	42.6
Dharmapuri	28.7	42.5
Karur	33.6	65.0
Namakkal	25.2	51.9
Theni	20.2	41.2
Tamil Nadu state average	25.0	53.4
All India average	35.5	57.0

Data Source: NFHS-5 (2019-21) State and District Fact Sheet Compendiums [http://rchiips.org/nfhs/NFHS-5_FCTS/COMPENDIUM/Tamil_Nadu.pdf]

Note:
 * Below -2 standard deviations, based on the WHO standard.
 ** Excludes pregnant women and women with a birth in the preceding 2 months.
 *** Haemoglobin in grams per decilitre (g/dl). Among children, prevalence is adjusted for altitude. Among women, prevalence is adjusted for altitude and for smoking status, if known. As NFHS uses the capillary blood for estimation of anaemia, the results of NFHS-5 need not be compared with other surveys using venous blood.

Note: The ten most vulnerable district listed above here in table is as per NICRA 2019 list in table earlier.

Nutritional status for most vulnerable districts of Tamil Nadu:

As observed in the above table the nutritional indicator value in the state of Tamil Nadu is comparatively better than the other two states under study. However, the stunting nutritional indicator per cent values for most of the vulnerable districts of Tamil Nadu listed above are way above the state average values (**a higher indicator % value means more vulnerable**). Though for both the nutritional indicators (stunting and anaemic women) for Tamil Nadu the state average value is less than that of the national average, it is still one of the key vulnerability outcome indicators that highlight the status of food security in the region/state. As far as stunting is considered, except for two districts (Thoothukkudi and Theni), rest all eight out of ten listed districts were found to be more than the corresponding state average values. District Karur with 33.6% was found to be the most affected district on the stunting criterion followed by Perumbalur (29.1%), Dharmapuri (28.7%), Dindigul (27.1%), The Nilgiris (26.7%), Ramananthapuram (26.4%), Ariyalur (25.3%) and Namakkal (25.2%), all being above the state average value and hence more vulnerable on this criterion. Coming to the anaemic women indicator criteria, values for the five out of ten listed districts were found to be above the state average values. District Perumbalur with 66.1% women (age 15-49 years) being anaemic was found to be the most vulnerable followed by Karur (65%), Ariyalur (62.4%), Thoothukkudi (55.9%) and Ramananthapuram (53.6%), all districts being above the state average. Also, three districts out of these five, namely - Perumbalur, Karur and Ariyalur were found to be more than the national average value (57%) for the anaemic women criterion.

Key vulnerable districts identified for Tamil Nadu:

Based on the three rankings, Ramananthapuram, Perambalur, Ariyalur, Dharmapuri and Karur appear most vulnerable to climate change in Tamil Nadu, following the same criteria as before. The proportion of the tribal population is very low in the state (~1.1% Scheduled Tribe population as per 2011 Census³²⁴). Hence, in some of the selected districts, the tribal groups will not be significant in the vulnerability study at even the district level. Of the vulnerable districts selected, only Dharmapuri has some presence, at approximately 60,000 population. It is also not significant at the State level analysis, but some specific attention may be paid to this marginalized category in that analysis. Again, district Ramananthapuram is historically considered the most drought-prone arid region of the state. Thus, out of the five key vulnerable districts mentioned here, we select Dharmapuri and Ramananthapuram as the targeted district for our study in the state of Tamil Nadu.

³²⁴ Website of Forest Department, Government of Tamil Nadu. [https://www.forests.tn.gov.in/pages/view/Tribal_Development_on-going#:~:text=TamilNadu%20has%207.21%20lakh%20tribal.of%20the%20population%20is%2027.9%25.]

Annex 8 Calculation of beneficiary numbers

Beneficiary Estimation

SRI LANKA: District population by gender (2021 mid-year estimate)

District	Total population in target districts	Male	Female
Kurunegala	1,743,000	837,000	906,000
Mannar	114,000	57,000	57,000
Monaragala	505,000	251,000	254,000
Mullaitivu	98,000	49,000	49,000
Trincomalee	441,000	218,000	223,000
Vavuniya	194,000	95,000	99,000
Total	3,095,000	1,507,000	1,588,000

INDIA: Figures obtained from the “2013 Population and Housing Census” and then adjusted by the national population growth of 2.9% per annum

State	District	Total population in target regions	Available project participants age 15-59	Females Age 15-59	Males Age 15-59
Andhra Pradesh	Kadapa*	360,857	223,731	77,470	59,639
Odisha	Nuapada	576,328	327,354	40,257	32,776
Tamil Nadu	Ramanathapuram	942,746	584,503	30,265	23,488
Total		1,879,931	1,135,588	147,992	115,903

Beneficiary by output	Consolidated	Sri Lanka	India
Direct			
Increase income	33,527	13,000	20,527
Diversified farms/Livelihoods	7,300	2,500	4,800
Sub total with duplication	40,827	15,500	25,327
Indirect	-		
LMCS	704,455	250,220	454,235
Community adaptation plan	942,768	375,000	567,768
Sub total with duplication	1,647,223	625,220	1,022,003
Total with duplication	1,688,050	640,720	1,047,330

Beneficiary Targeting Approach in India

Three eastern coastal states of India with semi-arid region namely Odisha, Andhra Pradesh, and Tamil Nadu have been identified as the project implementation area. Within three states based on their climate vulnerability³²⁵ and consultation with the national and state governments along with other stakeholders, Nuapada district from Odisha, Kadapa from Andhra Pradesh and Ramanathapuram from Tamil Nadu are identified project implementation. Selection of blocks, Gram Panchayats/villages and actual target beneficiaries will be done at the inception phase in discussions with the respective state governments.

Targeting Approach

The project will follow a three-pronged approach for targeting the project activities for ensuring the results.

- (i) At the first level, the project will work towards generating awareness and facilitate improved access to the Last Mile Climate Services and adaptation planning. This will also work towards demand generation and larger potential impact in terms of uptake of the services, awareness and opting for climate adaptive actions.
- (ii) Second level will work with the service providers at all levels from the government and non-government entities to strengthen the capacities to deliver climate resilient services, support strategies and actions by the communities in a sustainable way. This will also ensure working with universities, technical agencies and implementing agencies as providers of the climate services. It will also focus on creating platforms for knowledge sharing and dissemination.
- (iii) Work towards demonstration of impact on ground by engaging the communities and community level organizations (Civil Society Organization, Farmer Organizations and Women Self Help Groups). The implementation will not only provide benefit to the participants but will also provide learnings and good practices for potential replication/scale-up in the countries, region and globally.

Project Beneficiaries

India, the project plans to reach out to a total of 1,047,330 beneficiaries through the three approaches enlisted above. The climate advisories will reach about 454,235 which is about 40 percent of rural working population of the district. This will be done through the mechanisms developed through the project with combination of channels. The dissemination will focus on inclusive approaches to ensure an estimated 52% of the LMCS beneficiaries are women.

The project will select a few blocks and Gram Panchayats (Local Governance Structures) in each of the project districts for intensive engagement of the communities. The ongoing schemes and programmes of the Government of India in the region will be leveraged to maximize on synergies and avoid duplication of efforts. More intense work for adaptation planning will be undertaken in these areas and then the experiences will be shared through various forums to implement the Adaptation Planning and its incorporation in the development plans at each level will be done during the project period. This entire process of Adaptation Planning will cover an estimated 567,768 beneficiaries across the three project districts and states in India.

Capacity strengthening of national and sub-national stakeholders to co-produce tailored climate services will be delivered to 100 officials from Agromet and hydromet service providers in each of the project districts. Other efforts on capacity building will include on adaptation planning, solar based technologies, IOT based solutions and MIS. A total of 900 such stakeholders will be covered under capacity building initiatives.

Apart from the beneficiaries, the project also intends to undertake ecosystem-based services by creation, restoration and rehabilitation of micro-irrigation structures, soil and water conservation techniques, promoting climate resilient nutrition intense crops, follow integrated farming systems including the livestock and other non-farm activities. This will engage 6000 beneficiaries across the project districts. The project will promote renewable sources of energy, especially solar based technologies for farm-gate level processing and accessible cold storages in the project area. Additionally, alternate livelihood options will be supported through the project. Total 180 SHGs and 300 Farmer Organization members will be supported through such initiatives with established market linkages.

³²⁵ http://www.nicra-icar.in/nicrarevised/images/publications/Vulnerability_Atlas_web.pdf

Sessions, fairs and awareness campaigns will be organized for financial services linkages, awareness on issues of climate variability and food and nutrition security across the project areas. Regional and national learning and knowledge sharing will facilitate cross-fertilization of ideas and scale-up/sustainability.

The detailed beneficiary numbers are presented in the table below:

Project Beneficiaries: India													
S.No.	Project Components	Odisha			Tamil Nadu			Andhra Pradesh			Total		
		Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1	Climate Advisories (40% of Total Cultivators and Agricultural Labourers in Rural Areas of project Blocks)	130,942	74,637	56,305	233,801	151,971	81,830	89,493	54,590	34,902	454,235	281,198	173,037
2	Adaptation Planning (50% of Total Cultivators and Agricultural Labourers in Rural Areas of project Blocks)	163,677	93,296	70,381	292,251	189,963	102,288	111,866	68,238	43,628	567,794	351,497	216,297
3	Information on Financial Services, risk insurance and social protection (30% of Total Cultivators and Agricultural Labourers in Rural Areas in project blocks)	98,206	55,978	42,229	175,351	113,978	61,373	67,119	40,943	26177	340676	210898	129778
4	Training to national and sub-national stakeholders to co-produce tailored climate services	300			300			300			900		
5	Watershed management and integrated farming system	2 Gram Panchayat per block with 10 facilities created in each block			2 Gram Panchayat per block with 10 facilities created in each block			2 Gram Panchayat per block with 10 facilities created in each block			30 watershed facilities created in 18 Gram Panchayats		
6	Farmgate Level Processing	20 SHGs per block			20 SHGs per block			20 SHGs per block			180 SHGs		
7	Market Linkages and Capacity Strengthening	Reaching to 100 farmers through 1 FPO per district			Reaching to 100 farmers through 1 FPO per district			Reaching to 100 farmers through 1 FPO per district			300 Farmers and 3 FPOs		

Annex 9 Additional information on compliance with national technical standards

This annex contains additional information on compliance with national technical standards as they relate to all of the USPs in the Full Proposal. At this stage, the detailed information is only provided for India. It was not possible to gather this information in Sri Lanka at the time of finalisation of the FP due to the extremely challenging economic situation in Sri Lanka and the resultant impacts on all levels of society, including those of the Government departments. This detailed information will be gathered during the project inception phase and the additional details added to the ESMP where needed.

USP category	National technical standards	Steps taken to ensure compliance	Responsibility
INDIA			
USP category	National technical standards	Steps taken to ensure compliance	Responsibility
SLM / land and watershed restoration	<p>The project would be implemented along with various government nodal agencies and hence would be adhered to key government guidelines and standards such as Community Forest Rights (CFR) of the Forest Right Act, 2006 [hereafter FRA (2006)] guidelines as well as Biological Diversity Act, 2002 [hereafter BDA (2002)].</p> <p>Gol Guidelines for National Rural Livelihood Mission (NRLM) and MGNREGA (preferably for integration during implementation)</p>	<p>Project implementation at Gram Sabha level will involve the CFRC (Community Forest Right Committee) of the FRA (2006) as well as different committees and stakeholders involved therein and at other levels such as sub-divisional, district level and state level under the purview of FRA/CFR.</p> <p>The involvement of the community and their local knowledge would be key to the implementation of the SLM / land and watershed restoration projects.</p> <p>Every local body shall constitute a Biodiversity Management Committee (BMC) within its area for the purpose of implementation of SLM.</p> <p>The project implementation steering committees at state level will ensure compliances/approvals and involvement of the BMCs as well as the National Biodiversity Authority / State Biodiversity Board on matters falling under the purview of BDA (2002), wherever applicable.</p> <p>During the implementation of the SLM projects, various overlapping and conflicts with other forest and biodiversity legislations such as the Indian Forest Act 1927, Forest Conservation Act 1980, and Wildlife (Protection) Act 1972 will be examined and dealt with, carefully.</p> <p>Integration of MGNREGA and NRLM guidelines would be a key step in providing livelihood opportunities during the implementation of adaptation projects.</p> <p>Further steps for compliance will be taken in due process of the project implementations in consultation with the state governments who are custodian of enforcement of these guidelines.</p>	<p>National Project Coordinator.</p> <p>Sub-national Project Implementation Committees (PICs) with guidance from WFP</p> <p>Ministry of Tribal Affairs (MoTA) is the nodal agency for activities of the project falling under the purview of CFR/FRA.</p> <p>Further at the local level, Gram Sabha and CFRC are key agencies subsequently facilitated by Sub-divisional Level Committee (SDLC) and District Level Committee (DLC).</p>
Sustainable and climate-	Bureau of Indian Standards (BIS)	National Innovations in Climate Resilient Agriculture (NICRA) (2011)	National Project Coordinators.

resilient agriculture	<p>standards on Good Agricultural Practices</p> <p>Standards recommended by the Indian Council of Agriculture Research (ICAR), as well as packages of good practices of the respective States</p>	<p>Under this the main steps taken are strategic research, technology demonstrations and capacity building.</p> <p>Assessment of the impact of climate change simultaneous with the formulation of adaptive strategies is the prime approach under strategic research across all sectors of agriculture, dairy and fisheries.</p> <p>Evolving climate resilient agricultural technologies that would increase farm production and productivity vis-à-vis continuous management of natural and manmade resources</p> <p>National Mission for Sustainable Agriculture (NMSA), 2014 under Sustainable Agriculture Mission.</p> <p>Promoting sustainable agriculture through a series of adaptation measures focusing on ten key dimensions encompassing Indian agriculture namely; 'Improved crop seeds, livestock and fish cultures', 'Water Use Efficiency', 'Pest Management', 'Improved Farm Practices', 'Nutrient Management', 'Agricultural insurance', 'Credit support', 'Markets', 'Access to Information' and 'Livelihood diversification'</p> <p>NMSA is also catering to key dimensions of 'Water use efficiency', 'Nutrient Management' and 'Livelihood diversification' through the adoption of sustainable development pathways by progressively shifting environment-friendly technologies, adoption of energy-efficient equipment, conservation of natural resources, and integrated farming.</p>	<p>Sub-national Project Implementation Committees (PICs)</p> <p>Department of Agriculture and Farmers Welfare,</p>
Options to increase soil fertility	<p>Standards recommended by the Indian Council of Agriculture Research (ICAR), as well as packages of good practices of the respective States.</p> <p>USDA soil classification system.</p>	<p>The Soil Health Card Scheme (2015)</p> <p>It is being implemented through the Department of Agriculture of all the State and Union Territory Governments.</p> <p>SHC is giving each farmer a soil nutrient status of their holdings and advises them on the dosage of fertilizers and also the needed soil amendments, that they should apply to maintain soil health in the long run.</p> <p>It contains the status of soil with respect to 12 parameters, namely N, P, K (Macro-nutrients); S (Secondary- nutrient); Zn, Fe, Cu, Mn, Bo (Micro - nutrients); and pH, EC, OC (Physical parameters).</p> <p>To map the nutrient status of the area, soil samples are also drawn in a grid of 2.5 ha in irrigated areas and 10 ha in rainfed areas with the help of GPS tools and revenue maps.</p> <p>The National Project on Management of Soil Health and Fertility (2008)</p> <p>Facilitate and promote Integrated Nutrient Management (INM).</p> <p>Strengthen soil testing facilities and provide soil test-based recommendations.</p> <p>Promote use of soil amendments for reclamation of acidic/ alkaline soils for improving their fertility.</p>	<p>Department of Agriculture and Farmers Welfare</p> <p>Agriculture Commissioner, DAC</p> <p>State Agriculture Universities (SAU)</p>

		<p>Upgrade the skill and knowledge of STL/extension staff and farmers and their capacity building.</p> <p>Ensuring quality control of fertilizers through the strengthening of fertilizer quality control facility.</p> <p>Providing financial assistance for upgrading and setting up of STLs/Fertilizer Testing Laboratories.</p>	
Water conservation, irrigation, and rehabilitation of water infrastructure	<p>These projects should adhere to the various existing government guidelines and schemes such as in-line with the scope of the 'Command Area Development and Water Management (CAD&WM)' programme, Ministry of Water Resources, Gol.</p>	<p>These projects have to be implemented in a holistic manner <i>pari-passu</i> with irrigation project under 'Accelerated Irrigation Benefits Programme (AIBP)' so that irrigation potential created (IPC) with hydraulic connectivity gets utilized soon after its creation, improves water use efficiency, increases agricultural productivity and production and brings sustainability in the irrigated agriculture in a participatory environment.</p> <p>Key components and related compliances should be taken care of, for the implementation of water conservation and irrigation projects including Atal Bhujal Yojana and Jalashakti Abhiyan. More specifically:</p> <p>a) On-Farm-Development (OFD) works (comprising the construction of field channels, micro-irrigation land levelling/shaping wherever necessary)</p> <p>b) Reclamation of Waterlogged Areas: Mainly planning and designing for preventive and reclamation measures; Taking up the preventive and remedial activities like land management, drainage (surface, sub-surface, vertical etc.).</p> <p>c) One-time grants to Water Users Associations (WUAs): Essential to involve WUAs, as well as Village Panchayats in the planning and execution of OFD works.</p> <p>d) Correction of system deficiencies: Focus on improving the unreliability in the availability of irrigation water at the farm level that subsequently leads to reduced irrigation efficiency.</p> <p>e) Enforcement of Warabandi</p> <p>f) Inclusion of preventive measures or innovative infrastructures such as Integrated Land and Water Resource Management (ILWRM) or IWRM to prevent contamination of water from various natural and non-natural sources.</p>	<p>Crop Weather Watch Group (CWWG), Ministry of Agriculture & Cooperation (MOAC), Gol</p> <p>Central Water Commission (CWC), Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Gol</p>
Options to reduce heat stress	<p>NICRA-CRIDA Contingency Plans - District Agricultural Contingency Plans (DACP) [ICAR-CRIDA (nodal institute)]</p> <p>Manual for Drought Management, Department of Agriculture and Cooperation, Ministry of Agriculture, Gol.</p>	<p>The project implementation will involve the district administration/district committees at multiple levels as their role is crucial in the implementation of necessary adaptations strategy under the purview of the various guidelines and standards outlined under District Agricultural Contingency Plans, Manual for Drought Management, NDMA guidelines on heatwaves, etc.</p> <p>Sensitization of district authorities to respond to various weather aberrations and heatwaves affecting agriculture and livestock.</p>	<p>Ministry of Agriculture & Farmer Welfare(MOA&FW), Gol</p> <p>State government departments of animal husbandry, agriculture, forests, and the district administration</p>

	<p>National Disaster Management Authority (NDMA) guidelines for heatwaves, Do's & Don't's, and other resources.</p>	<p>Involvement of local communities in a participatory manner in the preparation of contingency and drought management plans.</p> <p>Dissemination of information and action guidelines among communities in regional/local languages by district authorities.</p> <p>Preservation of Fodder through fodder cultivation on the banks of canals or other irrigated areas; also protecting the available grass and grazing in the forests by DFO/Chief Conservator of Forests.</p> <p>Special measures for increasing fodder supply by procuring fodder through the FD, traders, tribals, private cultivators, Tribal Development Corporation, neighbouring states, etc.</p> <p>Clear guidelines and information dissemination for pre, during and post-heat stress events should take place at all levels of stakeholders involved.</p> <p>Further steps for compliance will be taken in due process of the project implementations.</p>	
Wildlife / human adaptation options	<p>The project should adhere to standard guidelines of the Wildlife (Protection) Act, 1972, National Wildlife Action Plan (2002-2016), BDA 2002 as well as similar schemes such as 'Integrated Development of Wildlife Habitats'.</p>	<p>Involvement of local communities and Gram Sabha along with the Forest Department in a participatory manner and in cooperation with civil society for 'Integrated Development of Wildlife Habitats' and protection of wildlife as well as demarcating boundaries outside protected areas and buffer zones.</p> <p>Adoption and integration of specific Standard Operating Procedures (SOPs) to reduce Human-Wildlife Conflicts (HWC) as seen in the case of the National Tiger Conservation Authority (NTCA).</p> <p>Facilitation of capacity development for key stakeholders to reduce HWC.</p> <p>Training and IEC activities for behavioural changes among local communities by Forest Department, NGOs and civil societies.</p> <p>Consideration of adequate compensation measures for livestock and human losses.</p> <p>Awareness and knowledge about compensation claims settlement process facilitated by Forest officials and NGOs/CSOs.</p> <p>Assessment of seasonal patterns of conflicts and adoption of precautionary measures accordingly by all the stakeholders.</p> <p>Further steps for compliance will be taken in due process of the project implementations.</p>	<p>Ministry of Environment, Forest and Climate Change (MoEFCC) is the nodal agency.</p> <p>National Board for Wildlife (NBWL) and State Wildlife Board (SBWL)</p>

<p>Post-harvest storage and renewable energy technologies</p>	<p>As of now, no standard or guidelines has been established for post-harvest technologies that are based on renewables. However, certain initiatives and best practices are widely accepted in practice such as the use of renewable technologies in cold chain supply, solar-based mini-grids, etc.</p> <p>At present, there is no specific legislation governing renewable energy in India. Since renewable energy is part of the electricity sector, it is governed under the provisions of the Electricity Act, which provides a framework for the generation, transmission, distribution, trading and use of electricity</p>	<p>Steps for compliance could be taken in due process of the project implementations based on field learnings and best practices.</p> <p>The involvement of local communities in a participatory manner along with other key stakeholders would be key to moving forward to implement such renewable-based post-harvest technologies.</p>	<p>Ministry of New & Renewable Energy (MNRE).</p>
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