REQUEST FOR PROJECT
FUNDING FROM THE ADAPTATION FUND

The annexed form should be completed and transmitted to the Adaptation Fund Board Secretariat by email or fax.

Please type in the responses using the template provided. The instructions attached to the form provide guidance to filling out the template.

Please note that a project must be fully prepared (i.e. fully appraised for feasibility) when the request is submitted. The final project document resulting from the appraisal process should be attached to this request for funding.

Complete documentation should be sent to:

The Adaptation Fund Board Secretariat
1818 H Street NW
MSN P4-400
Washington, D.C., 20433
U.S.A.
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List of acronyms and abbreviations

Adaptation Strategy	Strategy of Adaptation to Climate Change, Prevention and Minimization of its Adverse Effects
ADB	Asian Development Bank
AF	Adaptation Fund
AFA	Administrative/Finance Assistant
ALRI	Agency for Land Reclamation and Irrigation
AWP	Annual Work Plan
BCPR	Bureau for Crisis Prevention and Recovery
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
CAC	Central Asia and the Caucasus
CACAARI	Central Asia and the Caucasus Association of Agricultural Research Institutions
CA-CRM	Central Asian Multi-Country Programme on Climate Risk Management
CAFT	Climate adaptation through sustainable forestry in important river catchment areas in Tajikistan
CAREC	Central Asian Regional Economic Cooperation
CBD Strategy	National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity
CBOs	Community-based organisations
CCA	Climate change adaptation
CDP	Combined Delivery Report
CEP	Committee for Environmental Protection
CGIAR	Consultative Group on International Agricultural Research
CIA	Central Intelligence Agency
CSA	Climate-smart Agriculture
DDPs	District Development Plans
DoG	Department of Geology
DRMP	UNDP Disaster Risk Management Programme
DRR	Disaster risk reduction
EDB	Eurasian Development Bank
EbA	Ecosystem-based Adaptation
EIAs	Environmental Impact Assessments
EPs	Enterprise Plans
ESMF	Environmental and Social Management Framework
ESP	March 2016 Revision of the Environmental and Social Policy of the Adaptation Fund
FAO	The Food and Agriculture Organisation of the United Nations
FFSs	Farmer Field Schools
GBAR	Gorno-Badakhshan Autonomous Region
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse gas
GHG Strategy	Greenhouse Gas Abatement Strategy
GINA	Global Database on the Implementation of Nutrition Action
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit*
GLOFs	Glacial lake outburst floods
GoT	Government of Tajikistan
Hydromet	State Agency for Hydrometeorology
ICAS	Initiatives in Critical Agrarian Studies
ICARDA	International Center for Agricultural Research in the Dry Areas
ICR	Intelligent Character Recognition
IDA	International Development Association

IDS	Institute for Development Studies
IEF	Impact evaluation framework
ILO	International Labour Organisation
IMCC	Inter-Ministerial Coordination Council
IMS	Information Management Systems
INDC	Intended Nationally Determined Contribution
ISS	International Institute of Social Studies
IW	Inception Workshop
IWRM	Integrated Water Resources Management
KRB	Kofirnighan River Basin
KRBMP	Kafirnigan River Basin Plan and Management Plan
LITACA	Livelihood Improvement in Tajik-Afghan Cross-border Areas
LSIS	Living Standards Improvement Strategy of Tajikistan for 2013–2015
LUP	Land-use planning
M&E	Monitoring and evaluation
Masl	Metres above sea level
MEWR	Ministry of Energy and Water Resources
MFIs	Microfinance institutions
MHCRM	Multi-Hazard Climate Risk Model
MLRWR	Ministry of Land Reclamation and Water Resources
MTDP	Mid-term Development Programme 2016–2020
MTR	Mid-term Review
NAPCC	National Action Plan of Tajikistan for Climate Change
NCCAS	National Climate Change Adaptation Strategy Tajikistan: Building Capacity for Climate Resilience
NDRMS	National Strategy on Disaster Risk Management for 2010–2015
NDS	National Development Strategy
NEAP	National Environmental Action Plan
NHDR	National Human Development Report
NIM	National Implementation Modality
NPACD	National Programme of Actions to Combat Desertification
NPC	National Project Coordinator
NPD	National Project Director
OCSE	Organisation for Security and Cooperation in Europe
PES	Payment for Ecosystem Services
PGRFA	Plant Genetic Resources for Food and Agriculture
PLAAS	Institute for Poverty, Land and Agrarian Studies
PM	Programme Manager
PPCR	Pilot Programme for Climate Resilience
PPR	Project Progress Report
PRISE	Pathways to Resilience in Semi-arid Countries
PRS	Poverty Reduction Strategy
PSC	Project Steering Committee
PUUs	Pasture User Unions
Ramsar Convention	Convention on Wetlands of International Importance especially as Waterfowl Habitat
RBCs	River Basin Councils
RBOs	River Basin Organisations
DRS	Districts of Republican Subordination
SDC	Swiss Agency for Development and Cooperation
SIDA	Swedish International Development Cooperation Agency
SIWI	Stockholm International Water Institute
SLM	Sustainable Land Management
SPCR	Strategic Program for Climate Resilience

TJS	Tajikistan Somoni
ToT	Training-of-Trainers
TR	Terminal Review
UCA	University of Central Asia
UN Environment/ UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
Watershed	In this document, the smallest hydrological unit for management of land and water resources
WAPs	Watershed Action Plans
Water Reform Programme	Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025
WB	World Bank
WBG	World Bank Group
WHO	World Health Organisation
WMO	World Meteorological Organization
WUAs	Water User Associations

ADAPTATION FUND

PROJECT PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT INFORMATION

Project Category:	Regular Project
Country/ies:	Tajikistan
Title of Project	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan
Type of Implementing Entity:	Multilateral Implementing Entity
Implementing Entity:	UNDP
Executing Entity/ies:	Committee for Environmental Protection (CEP)
Amount of Financing Requested:	US$ 9,996,441

Project Background and Context:

Introduction

The Republic of Tajikistan (hereafter Tajikistan) is the most climate-vulnerable country in Central Asia. Extreme rainfall events have become more frequent and intense, the rainfall season has shortened in many parts of the country, air temperatures have risen markedly, and glacial melting is accelerating[1]. As a result, hydrometeorological disasters such as droughts, floods, mudflows and landslides are more frequent and rates of soil erosion across the country are increasing. The socio-economic impacts of these changes are considerable: livelihoods, agricultural productivity, water availability and hydroelectricity production are all compromised[2]. Indeed, natural hazards, most of which are linked to climate change (e.g. droughts and landslides), result in annual losses equivalent to ~20% of the country's Gross Domestic Product (GDP)[3].

The vulnerability of Tajikistan to climate change is exacerbated by a low adaptive capacity as a result of ageing infrastructure, the disproportionate number of women in poverty compared with men[4], and limited institutional capacity. This vulnerability is expected to intensify in the future, and consequently the building of climate resilience across the country is of paramount importance[5].

Given the above context, the proposed Adaptation Fund (AF) project will introduce an integrated approach to landscape management to develop the climate resilience of rural communities in Tajikistan. The proposed project's activities will focus in particular within one of the most climate-vulnerable river basins, namely the Kofirnighan River Basin (KRB). An integrated catchment management strategy will be developed for this basin which will be operationalised at *raion* (district), *jamoat* (sub-district) and village levels[6]. The strategy will provide detailed guidelines for suitable landscape management interventions to reduce the vulnerability to climate change.

[1] Third National Communication of the Republic of Tajikistan under the United Nations Framework Convention on Climate Change. 2014. Committee on Environmental Protection, State Administration for Hydrometeorology, Government of The Republic of Tajikistan.
[2] World Bank (WB). 2013. Tajikistan: Overview of climate change activities.
[3] WB 2013 Tajikistan: Overview.
[4] This phenomenon is referred to as the 'feminisation of poverty', where women bear the burden of poverty – particularly in developing countries – as a result of lack of income and gender biases.
[5] WB 2013 Tajikistan: Overview.
[6] The administration delineations are explained in the following sub-section on the socio-economic context of Tajikistan.

Important principles underpinning the strategy will include: i) climate risks will need to be managed at a range of spatial scales (catchment and watershed[7]); ii) upstream-downstream interactions at different time scales (e.g. via glacial lake outburst floods, flooding and soil erosion) will need to be understood by planners and decision-makers in the KRB; iii) long-term development plans for the KRB will need to include a focus on climate risk management; iv) a cross-sectoral and integrated approach for managing water resources, forests, pasture land and agricultural land at the watershed level will be required to build climate resilience; v) landscape management interventions will need to focus on Ecosystem-based Adaptation (EbA), which will invariably include elements of both Sustainable Land Management (SLM) and Climate-smart Agriculture (CSA) practices; and vi) existing knowledge management platforms and hubs will need to be used to present lessons learnt within the KRB for promoting future national upscaling and replication of the project's activities.

Complementing the catchment management strategy, the proposed project will directly build the resilience of selected communities by: i) implementing on-the-ground EbA; ii) supporting agro-ecological extension services to provide technical assistance on climate change adaptation practices to local community members; iii) promoting the development of business models that capitalise on EbA interventions; and iv) developing a Payment for Ecosystem Services (PES) approach to support the long-term financing of climate-resilient catchment management plans across Tajikistan.

Geographical context

Tajikistan is a small, landlocked country bordered by China to the east, the Kyrgyz Republic to the north, Afghanistan to the south and Uzbekistan to the north-west. The total land area of the country is 142,600 km^2, making it the smallest of all the Central Asian countries[8,9]. Over 90% of the land is mountainous terrain, with approximately half the country being more than 3,000 metres above sea level (masl). The topography of the country is extremely steep, with elevations ranging from 300–7,495 masl (Figure 1). This elevation range has resulted in a significant inter-seasonally and regionally variable climate. Elevation also influences the mean annual temperature, which ranges from -20°C–30°C, depending on the region. Similarly, mean annual precipitation varies geographically, ranging from ~30–1,800 mm per annum, and occurring mostly during a unimodal rain season that lasts ~7 months.

The mountainous regions of Tajikistan are of global importance as a glacial area. Approximately, 60% of the total number of glaciers in Central Asia are located within the country. Together, these glaciers make up ~6% of Tajikistan's land area and are important water reserves, storing ~406 km^3 of water and contributing to between 40 and 60% of the national renewable freshwater resources[10]. Two principle mountain ranges in Tajikistan – namely, the Pamir and Alay – give rise to several glacial-fed streams and rivers that are used to irrigate large areas of farmlands. Increased intensity of glacier melting is likely to lead to significant changes in the hydrological system and a greater risk of water-related natural disasters, such as floods and mudflows[11]. Over the last decade, water-related natural disasters have cost the Government of Tajikistan (GoT) more than US$1 billion and have resulted in the loss of hundreds of lives[12].

[7] The terms 'catchment' or 'basin' refer to a portion of land drained by a river and its tributaries, and are used interchangeably throughout this document. Catchments/basins can be subdivided into 'watersheds' i.e. areas of land around a smaller river, stream or lake.
[8] Third National Communication 2014.
[9] The total land surface areas of the remaining four Central Asia countries, in order of increasing size, are: i) Kyrgyzstan at 199,900 km^2; ii) Uzbekistan at 448,978 km^2; iii) Turkmenistan at 491,210 km^2; and iv) Kazakhstan at 2,725,000 km^2.
[10] United Nations Economic Commission for Europe (UNECE). 2017. Environmental Performance Review: Tajikistan, Third Review.
[11] Pathways to Resilience in Semi-Arid Countries (PRISE). 8 September 2018. "COMMENT: Tajikistan's glaciers melting – far more than just a loss of ice". Available at: http://prise.odi.org/comment-tajikistans-glaciers-melting-far-more-than-just-a-loss-of-ice/ [accessed 03.07.2018].
[12] PRISE 2018 "Tajikistan's glaciers melting".

Figure 1. Map showing the five administrative regions of Tajikistan, namely Sughd, Khatlon, Districts of Republican Subordination (DRS) (previously known as Karotegin Region), Badakhshan and Dushanbe[13,14].

Tajikistan's water resources are an integral contributor to the local economy, specifically for the agricultural and energy sector. Irrigation agriculture and livestock farming account for over 90% of annual water withdrawals, primarily from surface water sources. Despite this disproportionate water resource allocation to the agricultural sector, Tajikistan only develops 700–1,200 ha of land for irrigation annually. This amount is ~10 times less than what was planned in the Water Sector Development Strategy for 2010–2025[15]. Such slow progress in irrigating agricultural land is attributed to insufficient investment into the agricultural sector and has resulted in the country needing to import ~50% of most of its staple foods.

Socio-economic context

Tajikistan has a rapidly growing population, which at present numbers ~8.35 million[16]. Most people live in rural areas and are heavily dependent on agriculture for their livelihoods. Between 2005 and 2014, the population increased by ~22%[17]. Unlike many other countries globally, this rapid growth has not led to increased urbanisation. Indeed, the proportion of rural (~73%) to urban residents (~27%) has remained relatively constant since 2005[18].

The economy of Tajikistan is relatively weak compared with neighbouring countries – having the lowest per capita GDP (of ~US$970) in the United Nations Economic Commission for the Europe (UNECE) region. There has, however, been continuous growth in GDP over the last 20 years[19], with a total increase of 100%

[13] The five administrative regions of Tajikistan are: i) Sugd *oblast*; ii) Khatlon *oblast*; iii) Gorno-Badakhshan *oblast*; iv) Regional Republic Subordination (RRS) – which consists of 13 autonomous districts; and v) Dushanbe.
[14] Maps of the world. 2016. Maps of Tajikistan. Available at: http://www.maps-of-the-world.net/maps-of-asia/maps-of-tajikistan/ [accessed 03.07.2018].
[15] Water Sector Development Strategy for 2010–2025. 2009. Ministry of Land Reclamation and Water Resources (MLRWR) & Organisation for Security and Cooperation in Europe (OCSE), Dushanbe, Tajikistan.
[16] UN DESA/Population Division. 2017. World Population Prospects 2017. Available at: https://esa.un.org/unpd/wpp/Graphs/DemographicProfiles/ [accessed 03.07.2018].
[17] UNECE 2017 Environmental Performance Review.
[18] Ibid.
[19] Trading Economics. 2018. Tajikistan GDP per capita. Available at: https://tradingeconomics.com/tajikistan/gdp-per-capita [accessed 03.07.2018].

between 1998 and 2018. This growth has significantly improved the living standards of the population, resulting in a decrease in the number of people living below the poverty line from 53% to 36%[20].

Current socio-economic development trends in Tajikistan are closely connected to growth in the agricultural sector. This is because agriculture accounts for 75% of total employment and 23% of GDP, despite only 7% of the land surface being classified as arable. Cotton farming makes up the majority of the sector and is Tajikistan's main agricultural export product. Other agricultural focal areas include rice, grain, tobacco, corn, potato, vegetables, horticulture, vineyards and cattle breeding[21]. Like in other Central Asian countries, agricultural productivity showed a marked decline during the transition period from the Soviet Regime to independence[22], with productivity levels dropping ~50% by 1997[23]. By 2007, agricultural productivity in the country had, however, almost recovered to pre-transition levels, with the quantity of agricultural produce doubling again between 2005 and 2014[24].

Given the mountainous terrain of the country, transportation networks are integral to economic development[25] because they provide links to markets for multiple sectors, including agriculture. The main economic sectors in Tajikistan are, however, severely at risk from extreme climate events, particularly glacial lake outburst floods (GLOFs) and avalanches. GLOFs pose the most significant large-scale risk to transport networks – and consequently many other sectors – because of their unpredictability and the extent of affected area[26]. These events often cause extensive damage to trade networks, making them extremely detrimental to the economy[27]. In addition, both sudden and slow onset flooding events can cause landslides that have major negative impacts on the population[28].

Administrative delineations

The administrative division of the country is established by its parliament and consists of three tiers of local government. These tiers are described below.

- First tier: sub-district- or *jamoat*-level. These are village and town governments in rural areas.
- Second tier: district- or *raion*-level. These are the administrations of large cities and *raions* which are subordinate to *oblasts.*
- Third tier: *oblast*-level. These are the administrations of the capital city Dushanbe, as well as the *oblasts* of the Gorno-Badakhshan Autonomous Region (GBAR), Khatlon and Sougd, all of which are directly subordinate to the national government.

There are also District of Republican Subordination (DRS) which cover districts of Rasht and Gissar Valleys as well as those around the city of Dushanbe.

Tajikistan's capital city, Dushanbe, has 4 city districts, while the country's three *oblasts* have 58 rural districts between them. The GBAR is subdivided into 7 *raions* and 1 city; Sougd into 14 *raions* and 8 cities; and Khatlon into 24 *raions* and 4 cities[29]. Each *oblast, raion* and city has its own *khukumat*, or local council, with a chairperson who is appointed by the president and approved by respective council members. Local councils of second- and third-tier governments exercise the rights of self-government in their respective territories. Their decisions are legally binding for all institutions and organisations within their territories.

[20] UNECE 2017 Environmental Performance Review.
[21] National Action Plan of Tajikistan for Climate Change Mitigation (NAPCC). 2003. Main Administration on Hydrometeorology and Environmental Pollution Monitoring Ministry for Nature Protection of the Republic Tajikistan, Dushanbe.
[22] causes include the Tajik Civil War, removal of the centralised Soviet infrastructure and limited agricultural expertise
[23] Lerman Z. 2007. Tajikistan: An overview of land and farm structure reforms. The Hebrew University of Jerusalem. Discussion Paper 208.
[24] UNECE 2017 Environmental Performance Review.
[25] NAPCC 2003.
[26] Monhanty A, Mishra M, Mohanty B & BalaSuddareshwara A. 2011. Climate changes and natural hazards in mountain areas. Mountain Hazards 2011. Dushanbe, Tajikistan.
[27] The World Bank (WB). 13 September 2017. Strengthening infrastructure in Tajikistan for disaster and climate resilience. Available at: http://www.worldbank.org/en/news/feature/2017/09/04/strengthening-infrastructure-in-tajikistan-for-disaster-and-climate-resilience [accessed 03.07.2018].
[28] WB 2017 Strengthening infrastructure in Tajikistan.
[29] Ilolov M & Khudoiyev M. 2001. Local government in Tajikistan. In: Munteanu I (ed.) Developing New Rules in the Old Environment. Local Governments in Eastern Europe, in the Caucasus and in Central Asia. Budapest: Open Society Institute 603–648.

Legislation does not address local self-government activity below the level of villages and towns. However, grassroots organisations of community self-government, such as *Mahala* committees are widespread and often exercise limited autonomy in solving local issues[30].

Environmental context

Tajikistan is situated at the confluence of several diverse biogeographic regions. Influenced by variable weather patterns, these regions host a wide range of ecosystems, including glaciers, forests, woodlands, rangelands (steppe and grasslands), semi-deserts, deserts and wetlands[31,32]. The country is part of the Central Asia biodiversity hotspot[33], which supports a rich diversity of flora and fauna[34]. Ecosystems in Tajikistan are home to more than 23,000 plant species (of which ~8% are endemic) and more than 13,500 animal species (of which ~6% are endemic)[35]. Mountain ecosystems, situated between 600 and 7,000 masl, contain ~80% of the country's biodiversity and have high levels of endemism[36]. These mountain ecosystems also provide essential water resource services to their respective regions and to most of the country's summer pastures.

Tajikistan's 142,600 km^2 total land area is comprised of diverse ecosystems that support a range of land uses and resources, including:

- ~3% forests and shrublands;
- ~5% intensively-used arable land;
- ~32% agricultural lands, predominantly pastures; and
- ~60% natural (non-agricultural) areas, including glaciers, snowfields, well-vegetated mountain slopes, mountain deserts and rock/pebble fields[37].

Of Tajikistan's total land area[38], ~3.1 million hetares (~22%) is currently conserved[,39].Conservation areas within Tajikistan are formally recognised in the form of reserves and environmental protection zones[40,41,42]. Five wetlands are listed in terms of the Ramsar Convention[43] and one conservation area has been declared a United Nations Educational, Scientific and Cultural Organisation (UNESCO) world heritage site[44]. Despite these conservation efforts, degradation continues to occur over large parts of the country[45]. Illegal poaching and uncontrolled harvesting of plant species are of particular concern within the reserves and protection zones. Because there is such rich diversity in the country[46], the extinction risk to biodiversity is also high, with 226 plant species and 162 animal species currently classified as rare or threatened[47]. Expanding protected areas and eliminating threats to species extinction are focal areas for the GoT going forward[48,49].

[30] Ilolov & Khudoiyev 2001 Local government in Tajikistan.
[31] Squires VR & Safarov N. 2013. Diversity of plants and animals in mountain ecosystem in Tajikistan. Journal of Rangeland Science 43–61.
[32] National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (CBD Strategy). 2003. Government of Republic of Tajikistan, Dushanbe.
[33] Fauna and Flora International. 2018. "Tajikistan: Wild riches in a mountainous terrain". Available at: https://www.fauna-flora.org/countries/tajikistan [accessed 03.07.2018].
[34] World Wide Fund for Nature (WWF). 2018. Central Asia: Kyrgyzstan, Tajikistan, and Uzbekistan. Available at: https://www.worldwildlife.org/ecoregions/pa0808 [accessed 03.07.2018].
[35] CBD Strategy 2003.
[36] Squires & Safarov. 2013.
[37] NAPCC 2003.
[38] Third National Communication 2014.
[39] Third National Communication 2014.
[40] 4 reserves, 2 national parks and 13 wildlife reserves
[41] Third National Communication 2014.
[42] The Food and Agriculture Organisation of the United Nations (FAO). 2008. Country Report on the State of Plant Genetic Resources for Food and Agriculture. Republic of Tajikistan.
[43] Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention). 1971. UN Treaty Series No. 14583. As amended by the Paris Protocol, 3 December 1982, and Regina Amendments, 28 May 1987.
[44] Third National Communication 2014.
[45] FAO 2008 Country Report.
[46] Fauna and Flora International 2018 "Tajikistan: Wild riches in a mountainous terrain".
[47] CBD Strategy 2003.
[48] e.g. Tajikistan's national programmes on biodiversity and biosafety
[49] FAO 2008 Country Report.

Most territories of Tajikistan are prone to both natural and anthropogenic factors that contribute to land degradation (Figure 2). Tajik landscapes are affected by harsh climatic processes which degrade their health and function. Such harsh processes include freezing, thawing, physical destruction of soils from fluctuations in diurnal temperatures, dehydration, wind erosion and intense rainfall events[50]. Inappropriate land management such as the unsustainable use of forests and pastures, and the conversion of steep slopes for use in agriculture have contributed to the degradation of landscapes[51]. The effects of the harsh climatic processes coupled with the mismanagement of land are magnified by climate change factors.

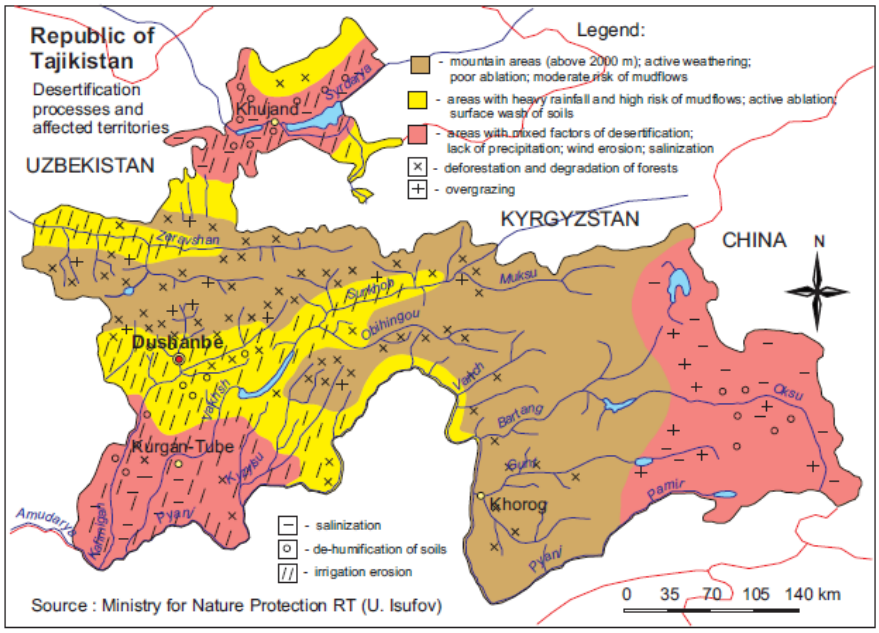

Figure 2. Desertification processes and territories in Tajikistan affected by *inter alia*: i) moderate risk of mudflows (brown); ii) high risk of mudflows, heavy rainfall and surface wash of soils (yellow); iii) desertification, lack of precipitation, wind erosion, salinization (pink); iv) deforestation (x); v) overgrazing (+); vi) salinisation (-); and vii) de-humification of soils (o).[52]

These factors include increasing air temperatures, increasing intensity of extreme rainfall events and the shortening of rainfall seasons. Climate change events have also resulted in the intensification of desertification, landslides, gully erosion and sheet erosion – with the washout of fertile topsoil affecting more than 100,000 ha[53,54]. Available estimates indicate that ~82% of all land in Tajikistan is degraded by soil erosion to some degree. This translates into ~98% of agricultural land being currently affected by soil erosion, with almost ~89% being affected by medium to 'very high' levels of erosion[55].

[50] NAPCC 2003.
[51] Third National Communication 2014.
[52] NAPCC 2003.
[53] NAPCC 2003.
[54] Third National Communication 2014.
[55] Poverty-Environment Initiative in Tajikistan. 2012. The Economics of Land Degradation for the Agricultural Sector in Tajikistan – A Scoping Study. Final Report, United Nations Development Programme (UNDP) and United Nations Environment Programme (UN Environment).

River systems

The terrain of Tajikistan has been eroded to form a diverse range of mountains and steep valleys. The country's mountain ranges create several hydrographic areas, which in turn form the two main river systems. These two rivers feed into six primary rivers across the country. In order of decreasing size and length, these six rivers are: i) Bartang; ii) Vahksh; iii) Pyanj; iv) Kofirnighan; v) Zarafshan; and vi) Karatag. Figure 3 illustrates the river basins in Tajikistan.

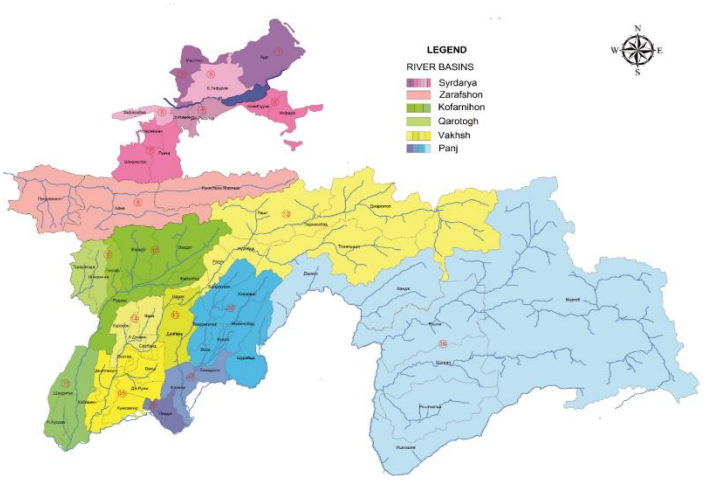

Figure 3. Map of river basins in Tajikistan, namely Bartang (labelled as Surdarya), Vahksh, Pyanj, Kofirnighan, Zarafshan and Karatag[56].

The Water Sector Reform Programme of Tajikistan for 2016–2025 (Water Reform Programme)[57] delineates four river basins according to hydrological boundaries. These four basins are the: i) section of the Syr Darya River that is located in Tajikistan; ii) section of the Pyanj River located in Tajikistan; iii) Vakhsh River Basin; and iv) the Kofirnighan River Basin.[58] By defining these river basins, the Water Reform Programme highlights the shift in the GoT towards improving management of these river systems away from using administrative boundaries. The programme also outlines the GoT's goal of promoting the implementation of integrated water resources management (IWRM) at a basin level.

Of the four river basins identified by Tajikistan's Water Reform Programme, the Kofirnighan River Basin (KRB) is one that currently does not have focused efforts being made towards IWRM[59]. Compared to the other three basins, KRB has received the fewest interventions from government and donors to date. The KRB is topographically and climatically very variable and is highly vulnerable to extreme climate events such as GLOFs, floods, mudflows and landslides[60,61]. It is also the smallest of Tajikistan's four basins and is fully encompassed within Tajikistan (i.e. is not transboundary). A Kofirnighan River Basin Management Plan (KRBMP) has been developed for the basin. Although this plan includes the measures for the improvement of water management, it does not integrate land and natural resources into the water management. Neither does it consider probabilistic impacts of climate change on the river basin hydrology and a broader catchment.

[56] Fergana Valley Water Resources Management (WRM). 2018. Kafirnigan River Basin Plan and Management Plan (KRBMP) Draft. Unpublished, Dushanbe, Tajikistan.
[57] Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme). 2015. Resolution of the Government of the Republic of Tajikistan. Unofficial translation.
[58] Water Reform Programme 2015.
[59] Fergana Valley WRM 2018 KRBMP Unpublished.
[60] State Agency for Hydrometeorology (Hydromet). 2018. Assessment of Kofirnighan River Basin (KRB), natural disasters and needs. Unofficial document.
[61] see sub-section on KRB below

Kofirnighan River Basin

The proposed project focuses its activities within the Kofirnighan River Basin (KRB) as, of the four basins within Tajikistan: i) the KRB has received limited international support for the implementation of integrated catchment management; ii) a large number of communities within the basin are highly vulnerable to a wide range of climate risks; iii) the basin's variable topographic and climatic conditions are highly representative of the conditions in Tajikistan; and iv) there are no transboundary disputes along the river[62]. A detailed justification for the selection of the KRB for project activity implementation has been included as Annex 3.

Situated in the south-western and western parts of the country, the KRB occupies a total area of ~11,600 km^2, with the mountain catchment making up 8,070 km^2 of this (equating to ~70% of the total basin area)[63]. The basin is divided into two regions, namely the north and the central/south regions[64]. The Gissar Valley encompasses the north region, which includes the city of Dushanbe, while the Kofirnighan and Beshkent valley depressions make up the south region. The Gissar Ridge forms the highland areas, extending for 250 km to elevations of ~4,500 masl and is home to 343 glaciers, covering a total area of 115 km^2.[65] The river of Kofirnighan, at ~387 km long, is one of the major contributing inflows of Tajikistan's largest river, the Amu Darya River[66]. It flows through different mountain ranges and zones within the basin including high mountains, intermediate foothills and low and flat zones. The basin's groundwater reserves are economically important and are used to irrigate crops (~98,000 ha) and pastures (~56,000 ha). Most of the irrigated land is in the arid southern sub-basin, while cultivated land in the northern sub-basin is largely rain-fed.

The mountain ranges and glaciers have a major influence on the air temperatures within the KRB. Temperature and precipitation gradients exist along the zones (mountainous, foothill, low), with temperatures increasing as one moves from the mountainous to the low-lying zones, and precipitation decreasing in this direction. In the mountainous areas of KRB, average temperatures range from 18°C in the summer months (hottest summer temperatures being ~35°C) to –8°C in the winter months (with cold air masses sometimes resulting in temperatures as low as –30°C). Intensely hot summer temperatures are typical for the south of KRB, which experiences mild winters compared with the north. Average temperatures in the southern areas of KRB range from ~31°C in the summer months (hottest summer temperatures being ~48°C) to ~2°C in winter (with temperatures dropping to as low as -28°C) [67].

In terms of political divisions, the KRB is made up of 10 administrative districts, 4 cities including Dushanbe, 10 villages and 77 *jamoats* (rural self-governance bodies). This division in the population is recorded in Table 1. As of January 2017, the total KRB population was 2.8 million people, with ~62% living in rural areas and ~38% in towns. Over the past 13 years, the KRB population has increased by 712,000 people (representing a ~34% total increase and an annual growth rate of 2.5%).

Table 1. Kofirnighan River Basin population numbers according to cities and villages[68].

No.	Districts and cities	Population[69]			Population density[70]	No. of cities	No. of urban-type settlements	No. of *jamoats*
		Total	City (%)	Village (%)				
1	Dushanbe	816,200	100	0	8162	1	0	0
2	Varzob	76,900	3	97	45,2	0	1	6
3	Vakhdat	324,000	17	83	87,6	1	1	10
4	Gissar	287,400	14	86	287,4	1	1	11
5	Faizobod	96,900	10	90	107,7	0	1	7

[62] reducing the project partners and stakeholders to within the country
[63] Tahirov IG & Kupayi GD. 1994. Water resources of Tajikistan of the Republic of Tajikistan. Dushanbe 1:181.
[64] Fergana Valley WRM 2018 KRBMP Unpublished.
[65] Ibid.
[66] Tahirov & Kupayi 1994 Water resources of Tajikistan.
[67] Fergana Valley WRM 2018 KRBMP Unpublished.
[68] Agency for Statistics. 2017. Regions of the Republic of Tajikistan. Under the President of the Republic of Tajikistan.
[69] Population census as at 1 January 2017.
[70] Population density is measured per km^2.

No.	Districts and cities	Population[69]			Population density[70]	No. of cities	No. of urban-type settlements	No. of *jamoats*
		Total	City (%)	Village (%)				
6	Tursunzade	280,000	19	81	233,3	1	0	9
7	Rudaki	476,500	11	89	264,7	0	3	13
8	Nosiri Khusrav	35,900	0	36	44,9	0	0	3
9	Kabodiyon	173,800	7	93	96,6	0	1	7
10	Shaartuz	120,500	14	87	80,3	0	1	5
Total		**2,802,500**	**38**	**62**	**180,8**	**4**	**10**	**77**

The State Agency for Hydrometeorology (Hydromet) has identified KRB as a basin particularly vulnerable to extreme climate events[71,72]. Such extreme events have affected 163 communities within the basin. These KRB communities are illustrated in Figure 3, including the main river and tributaries.

A methodology which ranks rural areas in terms of their vulnerability to climate impacts has been used to identify the specific districts within the KRB that are the most vulnerable to climate change[73,74]. Ranking of areas used the following criteria[75]:

- exposure to extreme climate events caused by climate change including temperature, precipitation, floods and drought;
- sensitivity to climate change on sectors/elements including productivity, poverty, access to land resources, dependence on agricultural production and diseases; and
- adaptation potential which included access to health care, education, drinking and irrigated water, cattle density and internal and external migration.

Taking the above criteria into account, the following districts were deemed the most vulnerable districts within KRB: i) Vakhdat, Faizobod and Varzob in the north; and ii) Nosiri Khusrav, Kabodiyon and Shaartuz in the south.[76] These six districts are described in greater detail in the sub-sections below[77].

[71] Hydromet 2018 Assessment of KRB, Unofficial document.
[72] Further information concerning the KRB's vulnerability to extreme climate events is presented under 'Climate change context'.
[73] Asian Development Bank (ADB). May 2016. Tajikistan: Building Capacity for Climate Resilience – Mid-term Report (MTR). Technical Assistance Consultant's Report. Prepared by ABT Associates for the ADB and GoT. Project No: 45436–001; TA 8090.
[74] This methodology was developed under ADB project, titled 'Building capacity for climate resilience in Tajikistan', which contributed to the development of the National Climate Change Adaptation Strategy Tajikistan (NCCAS).
[75] ADB 2016 Tajikistan: Building Capacity for Climate Resilience – MTR.
[76] Fergana Valley WRM 2018 KRBMP Unpublished.
[77] Further information concerning districts' vulnerability to extreme climate events is presented under district descriptions.

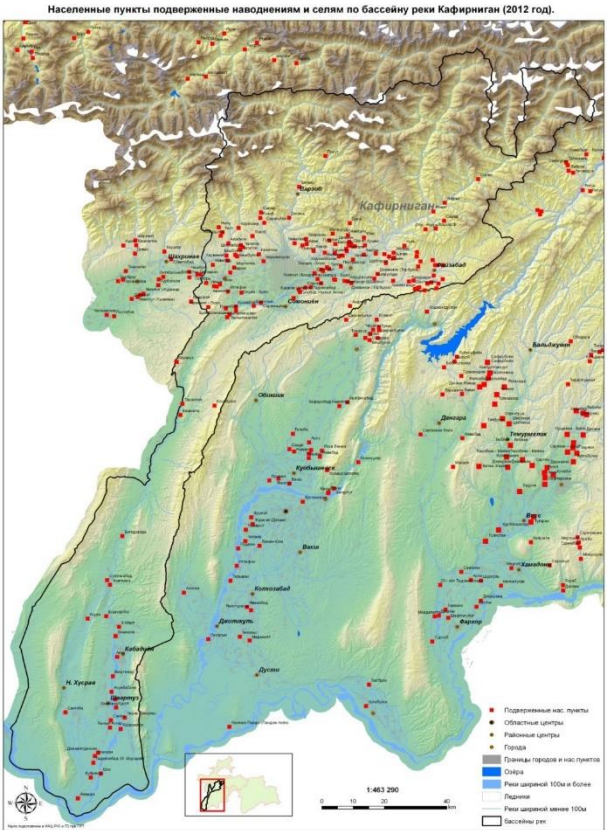

Figure 4. Map of Kofirnighan River Basin (outlined in black) indicating the most vulnerable communities to extreme climate events. Communities are indicated by a red dot.

Vahdat District

The district of Vahdat is situated ~10 km east of Dushanbe and, at 3,700 km^2, is one of the largest districts in Tajikistan. Altitude, which ranges from ~1,500 masl to more than 3,000 masl, is a major factor influencing the Vahdat climate. Warm summers and cool winters are experienced up to 1,500 masl, with average temperatures between 25–35°C in summer (July) and -5–0°C in winter (January). Between 1,500–2,500 masl, a moderate climate with a cool summer and a cold winter is experienced. At a height of more than 3,000 masl, cold winters are the norm, coupled with an average annual precipitation of 700–900 mm. The district has five rivers with the largest being the Kofirnighan River, at a length of 70 km[78].

As of 2017, the total population of Vahdat was 324,000 people, with ~83% of the population living in rural areas[79]. Of the total area of the district, agricultural land comprises ~142,000 ha (~38%), of which ~87% is pasture, ~9% is arable land and ~3% is cultivated with perennial trees. Approximately 58% of Vahdat's agricultural production is derived from the production of crops, whilst the remaining ~42% is derived from livestock products. More than 10% of the population works as migrant labourers outside the district.

Varzob District

Varzob District is situated north of Dushanbe and covers an area of ~1,700 km^2. The northern extent of Varzob is comprised of the Gissar Mountain Range with the Varzob River running through the entire district from north to south. The Gissar range results in a variable climate, with cold winters. In winter months, the temperature drops to -31°C, with snow thickness reaching up to 1.5 m. Annual average annual precipitation for the district is 960–990 mm. Snow deposits and glaciers make up ~52 km^2 of the total land area in Varzob.

[78] Fergana Valley WRM 2018 KRBMP Unpublished.
[79] Ibid.

These large snow- and glacier-covered areas within the district render most of the territory prone to natural disasters[80].

An array of natural disasters affect the district, including prolonged rainfall events, mudflows, landslides, rockfalls and avalanches. Approximately 31% of existing settlements within the district (22 out of 70) are prone to natural disasters, with ~4% of households located in hazardous areas[81].

The total population of the district is ~769,000 people, with ~97% of the population living in rural areas. Most of the land in the district comprises mountains (96%), with agricultural lands making up only ~2% (163,133 ha), pastures ~0.8% (67,811 ha) and non-agricultural lands ~1.1% (91,794 ha)[82]. Of the total agricultural land, ~0.6% (260 ha) is irrigated. Cultivated crop species include perennial fruit-bearing trees (309 ha), vineyards (383 ha), mulberry trees (51 ha) and other perennial trees[83] (19 ha). Approximately 56% of Varzob's agricultural production is derived from livestock, with ~44% derived from crops. Of the district's total working population, more than 4% works as migrant labourers outside of the district[84].

Faizobod District

The district of Faizobod covers an area of ~900 km^2 and is situated at an average altitude of ~1,200 masl. Faizobod climate is medium continental, with average temperatures ranging from ~14-28°C in summer (July) and 3°C in winter (January). Average annual precipitation in the mountainous areas is 1,136 mm and is 767 mm in the valleys[85].

As of 2017, the total population of the district was 96,900 people. Approximately 90% of the district's population live in rural areas, with the remaining 10% living in urban settlements. Land use within the district is divided between pastures (~58%), arable land (~9%), forests and shrubs (~8%) and perennial trees (~5%). The Faizobod agricultural sector is comprised of livestock production (~57%) and crop production (~43%). More than 13% of the population works as labourers in other districts[86].

The main natural disasters occurring within Faizobod are floods, mudflows and landslides. All these disasters are primarily caused by the flooding of the Surkhdara and Elok Rivers. Negative impacts from these disasters threaten 26 villages, which make up ~7% of the district's population. This equates to ~6,559 people or 1,059 households[87].

Nosiri Khusrav District

The Nosiri Khusrav district is ~800 km^2 and occurs at altitudes ranging from 380–400 masl. The climate in the district is dry and subtropical, with hot and dry summers and mild winters. The average temperature in summer (June–August) ranges from 40–55°C and is 10°C in winter (January). Total annual precipitation during winter months reaches 80 mm, with even less precipitation during spring and autumn months (up to 25–30 mm).

In 2017[88], the total population of Nosiri Khusrav was 35,900 people, with the entire population living in rural areas. As of 2014, ~84% (67,423 ha) of the district's total area was comprised of agricultural land, with ~16% (11,022 ha) of this land being irrigated. Of the total working population, more than 12% work outside of the district as labour migrants.

Shaartuz District

The district of Shaartuz covers ~1,500 km^2, with a flat topography relative to other KRB districts. Only ~9% of the total district area is occupied by low mountain ranges. These ranges include: i) Bobotog (up to 2,100 masl); ii) Tuyuntog (up to 1,314 masl); and iii) Ariktog (just over 800 masl). The climate of the region is dry

[80] Fergana Valley WRM 2018 KRBMP Unpublished.
[81] Ibid.
[82] Fergana Valley WRM 2018 KRBMP Unpublished.
[83] e.g. walnut orchards
[84] Fergana Valley WRM 2018 KRBMP Unpublished.
[85] Fergana Valley WRM 2018 KRBMP Unpublished.
[86] Ibid.
[87] Ibid.
[88] as of January 2017

and subtropical, with warm-hot, dry summers and mild winters. The average annual temperature is ~32°C, with an average annual precipitation of 143 mm. In the low mountain areas, this annual precipitation average reaches 200 mm. The warm summer period lasts for ~190 days with humidity during these months reaching ~23%.

As of 2017, the total population of the district was 120,500 people. Approximately 87% of the population live in rural areas, with the remaining ~13% being situated in urban areas. The density of the population is 80 people per km^2. Of Shaartuz's total working population, more than 7% work as migrant labourers beyond district borders.

Kabodiyon District
The district of Kabodiyon covers 1,900 km^2. It is located in the south of the Gissar and Alai Highlands, at an average altitude of ~788 masl. Kabodiyon is surrounded by the mountain ranges of Bobotog, Oktoi, Karotog and Chilontoy and consequently has a dry and continental climate. In winter (January), air temperatures range from -2–2°C, while summer (July) temperatures range from ~24–41°C.

The total population of the Kabodiyon District is 173,800 people. Approximately 93% of the population lives in rural areas, with a density of ~97 people per km^2. More than 11% of Kabodiyon's working population works as migrant labourers outside of the district.

Ecosystem goods and services

Tajikistan's natural systems provide numerous ecosystem goods and services. These critical ecosystem services can be broadly categorised into:
- provisioning services – products obtained directly from ecosystems;
- regulating services – benefits obtained through the regulation of ecosystems;
- cultural services – non-material benefits obtained through ecosystems; and
- supporting services – services necessary to produce all other ecosystem services.

Ecosystem services that are currently under threat from climate change and the effects thereof in Tajikistan are outlined in Table 2 according to the above four categories.

Table 2. A description of ecosystems goods and services in Tajikistan threatened by climate-induced and anthropogenic factors.

Service	Description of threat to service
Provisioning services	
Fresh water	Catchments – particularly in the Pamir Mountains in western Tajikistan – provide fresh water not only to the country, but to the greater Central Asian region. The impacts of climate change on these areas significantly affect areas downstream. Predicted climate change impacts on river discharge are varied, with models under 'hot and dry' scenarios showing a reduction in river discharge and 'warm and humid' scenarios showing the converse. Additionally, climate-induced rising air temperatures are causing increased melting of glaciers, snow cover and permafrost soils[89]; all of which affect catchment hydrology through increased run-off and large-scale gully and sheet erosion[90].
Food	Tajikistan's agricultural sector is an integral component of the country's economy, contributing more than 20% of the GDP[91,92]. Approximately 70% of Tajikistan's population live in rural areas and is dependent on agriculture. Crop and livestock productivity, especially in dry-land farming, are vulnerable to climate variability, particularly drought and extreme temperatures[93], as well as soil erosion, declining soil fertility and unsustainable use of pastures[94].

[89] Third National Communication 2014.
[90] NAPCC 2003.
[91] Third National Communication 2014.
[92] Curtain M. 2001. Environmental profile of Tajikistan. Asian Development Bank (ADB).
[93] Third National Communication 2014.
[94] Ibid.

Service	Description of threat to service
Raw materials	Forests are a critical resource to communities[95], providing food and wood, as well as fodder and grazing to support livelihoods[96]. Permanent pastures currently cover ~3.6 million ha[97,98] of land in Tajikistan. Degradation is widespread in these areas and is primarily characterised by an increase in unpalatable grasses as well as a 15–20% decrease in productivity[99]. Sheep and goats are generally shepherded to high-altitude, summer pastures, returning to low-altitude, village pastures for the winter period[100]. Cattle are often grazed near villages resulting in severe degradation of rangelands through overgrazing[101]. Climate change impacts – predominantly droughts and extreme temperatures – have been greatest on dry-land farms and pasture lands, resulting in declining crop productivity and livestock carrying-capacity, respectively[102].
Energy	Hydropower currently contributes 98% to Tajikistan's energy supply, with coal-, solar- and biomass-derived power providing the balance; however, this supply does not meet the country's annual requirements. Tajikistan has considerable hydropower potential[103,104] and development of more hydropower plants is a national priority[105]. Large-scale soil erosion and intense climate-induced hydrometeorological events damage hydropower infrastructure, for example through siltation of dams and damage to turbines[106]. The ability to generate hydropower is negatively impacted by climate-induced fluctuations in river discharge.
Genetic plant resources	Tajikistan is an important source of agro-biodiversity and is one of the main countries of origin for cultivated plants worldwide[107] for example the mountainous regions of the country host wild plantations of many different species of fruit trees[108,109]. Numerous anthropogenic[110] and natural factors pose a risk to this indigenous plant genetic material[111]. Some of the natural factors exacerbated by climate change include drought, hot and dry winds, extreme frosts, plant diseases, plant pests and soil salination.
Regulating services	
Water purification, water regulation and erosion control	Excessive climate change-induced run-off of water from mountain slopes is causing large-scale soil erosion, including sheet and gulley erosion, across the country. This erosion poses considerable risk to Tajikistan's food, water and energy security[112]. Such large-scale soil erosion is affecting water infiltration, percolation and retention and is consequently hampering water purification and regulation services[113]. Inappropriate land-use – such as deforestation, over-grazing and cultivation of steep slopes – further reduces soil function[114].
Climate regulation; carbon sequestration	Although pastures in Tajikistan contribute less plant biomass per unit area than forests, pastures cover ~32% of the total land area[115] and consequently fulfil an important function in climate regulation and absorption of atmospheric carbon. The natural vegetation of Tajikistan produces ~80 million tonnes of phytomass annually, ~39% of it occurring above-ground and 61% underground[116]. Pastures are particularly vulnerable to climate change-induced degradation that causes reduced vegetation cover, negatively affecting livestock productivity[117].

[95] Fauna and Flora International 2018 "Tajikistan: Wild riches".
[96] A large part of the remaining forest area is given for long-term use as pasture.
[97] equivalent to almost 29% of its total land area
[98] The Food and Agriculture Organisation of the United Nations (FAO). 2008. Tajikistan: Reducing the Impact of Price Surge and Agriculture Rehabilitation Programme. Appraisal Document.
[99] Third National Communication 2014.
[100] FAO 2008 Tajikistan: Reducing the Impact.
[101] Third National Communication 2014.
[102] Ibid.
[103] approximately 3.6 mln kWh/1 km/year
[104] Third National Communication 2014.
[105] Ibid.
[106] Third National Communication 2014.
[107] UNDP-GEF. 2009. Project title: Sustaining agricultural biodiversity in the face of climate change in Tajikistan: vulnerability and adaptation. [accessed 03.07.2018].
[108] In many cases, the distinction between cultivated and wild plants is unclear.
[109] FAO 2008 Country Report.
[110] including deforestation, overgrazing, overharvesting for fuelwood and medicinal purposes, and grubbing of old orchard
[111] FAO 2008 Country Report.
[112] Ibid.
[113] NAPCC 2003.
[114] Third National Communication 2014.
[115] NAPCC 2003.
[116] FAO 2008 Country Report.
[117] Third National Communication 2014.

Service	Description of threat to service
Disease regulation	Climatic variability increases the vulnerability of Tajikistan's population to infections and diseases including malaria and typhoid[118,119]. The agricultural sector in the country is also increasingly at risk to plant pathogens and pests. Crop breeding programmes in the country are currently aiming to produce crop varieties with enhanced resistance[120] to mitigate these negative effects.
Cultural services	
Scenic and cultural resources	Tajikistan's rich culture derives from natural, heritage and spiritual resources. The country has two UNESCO world heritage sites: i) the Tajik National Park in the Pamir Mountains; and ii) the Proto-urban Site of Sarazm, an archaeological site.[121] The ancient Silk Road network of the Central Asian region passes through Tajikistan[122,123], and is a major tourist attraction along with the numerous towns, castles and ruins along the route[124]. The country's scenic and cultural services are threatened by climate change impacts (such as GLOFs, floods, mudflows, landslides and drought) that cause the damage or degradation of natural, heritage and spiritual resources.
Recreation	Tajikistan's mountainous areas[125] host a hiking industry, and a growing tourism sector has supported the establishment of health resorts around the country's natural springs. Tourism has recently become an important sub-sector in the country's economy[126]. In 2016, tourism contributed 8.2% to GDP (equating to US$0.6 billion). The contribution to employment of this sub-sector, including jobs indirectly supported by it, was ~21% of total employment (490,500 jobs)[127]. The dependence of nature-based tourism on natural resources renders recreational services particularly vulnerable to the impacts of climate change.
Science and education	Tajikistan's natural protected areas are increasingly being used by schools to promote science and ecological research. The GoT recognises that scientific institutions, in partnership with the institutes of higher education, are important for developing research capacities on climate change and environmental science[128]. Public environmental organisations are also playing an important role in environmental protection and education in Tajikistan. There are ~40 registered environmental NGOs in Tajikistan, primarily addressing biodiversity conservation in and around protected areas. Their principal activities include ecological awareness, education, information generation, information dissemination, and research related to biodiversity and protected area development[129]. Climate change impacts — resulting in the degradation of landscapes (within which research sites occur) and the physical damage to infrastructure (e.g. community education centres) and in-field research equipment — negatively impact the country's scientific and educational services.
Spiritual and religious	Approximately 90% of Tajikistan's population is Muslim[130,131], with the balance comprising several other religions[132]. Despite having been predominantly Muslim since the 10th century, in some communities, traditional, non-Muslim, cultural practices are still held, particularly among the elderly. Ancestors of Tajik people worshipped nature and natural phenomena, and many of these methods are still being practised. In some mountainous regions, animals such as eagles and hawks are considered animal totems, and the elements of earth, water and fire hold particular cultural significance in day-to-day life and ceremonies. For example, fire is used in wedding rituals (fires are burnt near to the groom's house to light the road; the bride jumps over a large fire before entering her husband's house) and rituals for pregnancy and childbirth (a fire is kept burning during

[118] The transmission of typhoid is increasing, which has been coupled with a reduction in the quality of drinking water especially during intense rainfall events.
[119] Third National Communication 2014.
[120] FAO 2008 Country Report.
[121] United Nations Educational, Scientific and Cultural Organisation (UNESCO). 2018. World Heritage Convention: Tajikistan. Available at: https://whc.unesco.org/en/statesparties/tj [accessed 03.07.2018].
[122] including the areas of Penjikent, Khujand, Istarafshan and Gissar
[123] The road splits west of the Pamirs, one branch passing to the north of the Pamirs and the other to the south. See further: UNESCO 2018 World Heritage Convention.
[124] Third National Communication 2014.
[125] Third National Communication 2014.
[126] Ibid.
[127] World Travel and Tourism Council (WTTC). 2017. Travel and Tourism: Economic Impact 2017 Tajikistan.
[128] Third National Communication 2014.
[129] FAO. 2008. Tajikistan: NFP update.
[130] with Sunni Muslim comprising ~85% and Shia Muslim comprising ~5%
[131] Central Intelligence Agency (CIA). 2018. The World Factbook: Central Asia: Tajikistan. Available at: https://www.cia.gov/library/publications/the-world-factbook/geos/ti.html [accessed 03.07.2018].
[132] There are 85 non-Muslim groups registered with Tajikistan's Department of Religious Affairs at the Ministry of Culture.

Service	Description of threat to service
	pregnancy, childbirth and for the 40 days of the child's life)[133]. Since some aspects of the spiritual/religious services are underpinned by nature, although difficult to quantify, the climate change-induced degradation of natural resources would result in the gradual erosion of these services.

Climate change context

Observed climate change

Tajikistan has experienced a considerable warming of its climate since 1950[134] (Figure 5). The most recent warming trend from 1976 to 2010 averaged ~0.15ºC per decade in winter and spring, ~0.3ºC per decade in summer and ~0.2ºC per decade in autumn. From 2001 to 2010, the country experienced the warmest decade in its history (12)[135]. Average temperatures for the decade were: i) 1ºC above the long-term average in the foothills (0–1,000 m); ii) 0.8ºC above the long-term average in the mid-hills (1,000–2,500 m); and iii) 0.2ºC above the long-term average in the highlands (above 2,500 m).[136]

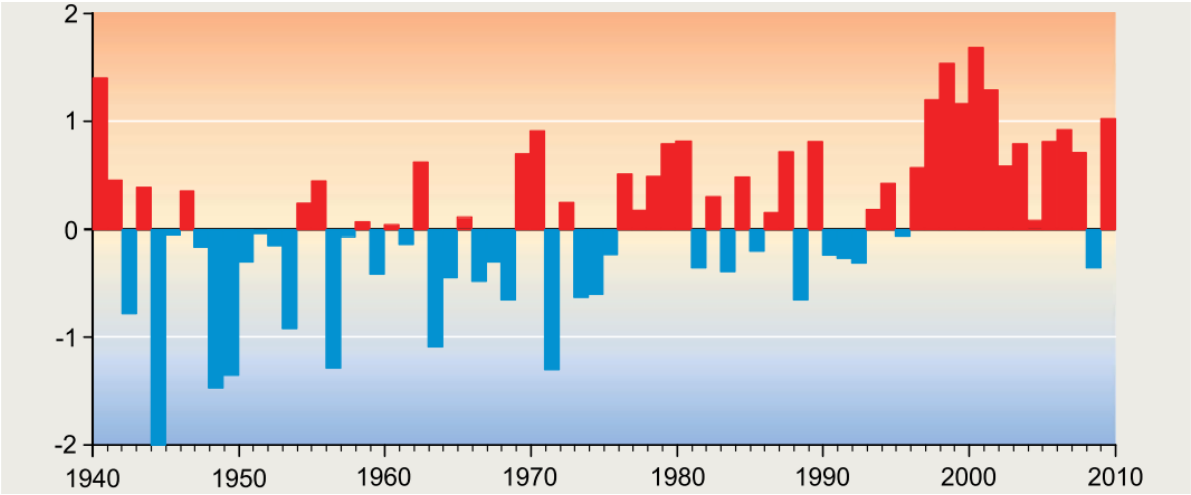

Figure 5. Illustration of the annual temperature (ºC) departure from the average long-term norm for the period 1961–1990 in Tajikistan[137].

The temperature changes across Tajikistan have been accompanied by increasingly erratic rainfall (Figure 6) which has resulted in both: i) an increase in rainfall intensity; and ii) longer dry spells.[138] In recent years, the amount of precipitation[139] received across the country has been above the long-term annual average. For example, from 1940–2010, average annual precipitation increased by ~7%. This trend has not been uniformly distributed across the country, with some regions experiencing increases in annual rainfall and others experiencing decreases. Decreases in annual precipitation have been experienced in the following regions:

- mid-hills and highlands of Central Tajikistan;
- valleys of southwestern and northern Tajikistan;

[133] Advantour. 2018. "Tajikistan Rituals". Available at: https://www.advantour.com/tajikistan/traditions/wedding-rituals.htm [accessed 23.07.2018].
[134] Third National Communication 2014.
[135] State Agency for Hydrometeorology. 2018. Under the Committee for Environmental Protection under the Government of the Republic of Tajikistan Available at: http://www.ijozat.tj/index.php?option=com_content&view=section&id=30&lang=en [accessed 03.07.2018].
[136] Third National Communication 2014.
[137] State Agency for Hydrometeorology 2018.
[138] Ibid.
[139] 'Precipitation' refers to the combined amount of rainfall and snowmelt.

- foothills of Turkestan range;
- highland areas of Eastern Pamir; and
- foothills, mid-hills and highlands of the Khatlon region.

Over the same period, annual precipitation increased in the Rasht and Darvaz regions by 14–18%, the Western Pamir region by 12–17% and in the Fedchenko Glacier by 36%[140].

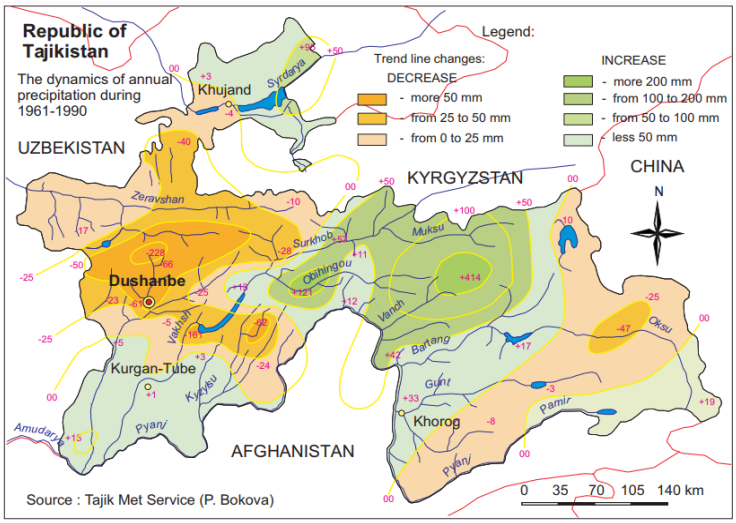

Figure 6. Changes of mean annual precipitation observed across Tajikistan during 1961–1990[141].

The number of days with precipitation (hereafter referred to as 'rain days') has decreased across the country since 1961[142]. By contrast, the number of days in which heavy precipitation events have occurred have increased[143]. The decrease in rain days coupled with the increase in heavy precipitation events equates to an increase in rainfall intensity in Tajikistan[144].

Fewer rain days and increased temperatures have resulted in a greater incidence of intense dry spells across Tajikistan[145]. In the major crop-growing regions, droughts that impact yields by at least 20% have been increasing in frequency over the past decade. Currently, these droughts occur once in every[146]:

- 3 years in south and south-east Tajikistan, Danghara, Kulyab, Bokhtar, Kabodiyon and Shaartuz regions;
- 4 years in the Eastern Tajikistan region; and
- 5 years in the North-Tajikistan region.

Severe droughts – those that reduce average crop yields by at least 50% – have been observed once in every[147]:

- 4–5 years in the Bokhtar, Kabodiyon, Vakhsh and Shaartuz regions;
- 6–8 years in the Danghara, Kulyab, Temurmalik, Baljuvon, Vose and Balkhi regions;
- 9–11 years the in Devashtji, Spitamen and Istaravshan regions; and

[140] NAPCC 2003.
[141] Third National Communication 2014.
[142] Ibid.
[143] Kayumov 2016 Glaciers resources of Tajikistan.
[144] Third National Communication 2014.
[145] World Food Programme (WFP). 2017. Climate Risks and Food Security in Tajikistan: A Review of Evidence and Priorities for Adaptation Strategies.
[146] The Food and Agriculture Organisation of the United Nations (FAO). 2017. Drought Characteristics and Management in Central Asia and Turkey. FAO Water Report 44: Policy Support and Governance.
[147] FAO 2017 Drought Characteristics and Management.

- 12–15 years in the Kanibadam Asht and Isfara regions.

Climate risks, impacts and vulnerabilities

As noted previously in this document, Tajikistan is the most vulnerable country to climate change in Central Asia[148]. This vulnerability is attributed to the country's: i) weak social structures; ii) low adaptive capacity; ii) underdeveloped infrastructure; iv) low-income insecurity; v) poor service provision; vi) strong dependence on agriculture; and vi) institutional constraints. Losses from natural hazards currently amount to ~20% of the country's GDP[149] and climate change impacts are predicted to increase the frequency and magnitude of such losses. In the future, loss amounts are expected to rise from ~US$50 million in 2014 to ~US$132 million by 2030[150] (Table 3).

Table 3. Total countrywide damages caused by climate change and extreme climate events[151].

Risks and hazards	Total damage countrywide			
	2014 (US$)	**2030** (US$)	**Increase** (US$/year)	**Increase** (%)
Rise in temperature	22,230,000	42,210,000	19,980,000	90
Drought	22,230,000	42,210,000	19,980,000	90
Pasture degradation	4,131,000	41,310,000	37,179,000	900
Mudflows	432,000	2,331,000	1,899,000	440
Intense precipitation	342,000	531,000	189,000	55
Water logging	324,000	504,000	180,000	56
High water and flooding	144,000	2,313,000	2,169,000	1,506
Gusty winds	144,000	144,000	0	0
Decrease in air temperature/freezing	126,000	126,000	0	0
Duration of snow cover	90,000	90,000	0	0
Landslides	63,000	540,000	477,000	757
Agricultural insects and pests	63,000	630,000	567,000	900
Dust storms	45,000	45,000	0	0
Avalanches	27,000	270,000	243,000	900

Negative effects of climate change on the Tajik population include: i) glacial and permafrost melt; ii) increased rainfall intensity; and iii) longer and more frequent dry spells.[152] Together, these effects have increased the rate of topsoil erosion, threatening the food, water and energy security of the country[153]. Approximately 33% of all agricultural losses in the country are currently attributable to climate change and variability[154]. Furthermore, it has been projected that crop yields in Tajikistan will decrease by an additional 5–30% by 2050, with the potential for severe negative impacts on the country's economy[155].

[148] WFP 2017 Climate Risks and Food Security.
[149] Ibid.
[150] National Climate Change Adaptation Strategy Tajikistan: Building Capacity for Climate Resilience (NCCAS). 2016. Asian Development Bank (ADB) and the Government of Tajikistan (GoT). Draft prepared by Abt Association with the GoT Committee of Environmental Protection (CEP).
[151] United Nations Development Programme (UNDP). 2014. Central Asian Multi-Country Programme on Climate Risk Management (CA-CRM). Regional Project Document. Atlas Award ID 59476.
[152] UNDP 2014 CA-CRM.
[153] Third National Communication 2014.
[154] National Human Development Report (NHDR). 2012. Tajikistan: Poverty in the Context of Climate Change. United Nations Development Programme (UNDP), Dushanbe.
[155] Third National Communication 2014.

Glacial melt poses a particularly large risk to the population of Tajikistan, currently averaging ~2 km^3 per year and leading to meltwater flows which often result in large-scale sheet and gully erosion[156]. Further negative impacts of meltwater flows include high frequency, low–medium impact hazards (such as extreme river flows and flooding, mudflows and landslides), and low frequency, high impact hazards (such as GLOFs) [157]. These low frequency, high impact hazards are particularly problematic because they are likely to trigger multiple other hazards, such as flash floods and landslides, as well as aggravate the scale and magnitude of such hazards. The impacts of flooding, mudflows, landslides and other hazards have resulted in considerable economic damages and losses of life across Tajikistan. Such damages and losses of life are particularly marked in the KRB (Table 4).

Table 4. Economic damages as a result of climate hazards occurring within the Kofirnighan River Basin, including number of events occurring from 1998–2014 and losses in life[158].

Climate hazard	**Number of events** (occurring from 1998–2014)	**Economic damages** (US$)	**Loss of life** (no. of people)
Flooding	31	5,577,682	0
Mudflows	98	191,898,148	38
Avalanches	8	326,808	8
Landslides and rockfalls	39	138,115	3
Drought	17	3,359,363	0
Earthquakes	83	1,37,017	0
Total	**276**	**202,437,132**	**49**

The negative impacts described above have been exacerbated by increasingly erratic rainfall. Floods and droughts caused by such erratic rainfall directly impact water quality and quantity across the country, and have also contributed to topsoil erosion[159]. The increasing rate of topsoil erosion is a threat to Tajikistan's food, water and energy security, which impacts the livelihoods, health and wellbeing of the population with regards to: i) food production, whereby decreasing soil fertility is reducing crop and livestock productivity; ii) water supplies, whereby the siltation of rivers is further contributing to declining water quality; and iii) energy security, whereby damage from silt to turbines in hydropower plants and reservoirs is reducing the efficiency of hydropower generation.

The KRB has been identified as a region within Tajikistan that is particularly vulnerable to the impacts of extreme climate events, with almost 200 communities living in the basin experiencing severe negative impacts[160,161]. All four of Tajikistan's agro-ecological zones are represented within the KRB as a result of the considerable altitudinal variation from south to north[162]. This altitudinal variation also results in the KRB being vulnerable to a wide range of climatic hazards, including both sudden-onset and slow-onset climate events, such as GLOFs and droughts, respectively. Communities in the KRB are frequently exposed to such extreme climate events. Flooding and landslides pose the greatest threats to these communities, with flooding seasons differing between upper, middle and lower reaches of the KRB. Upstream reaches experience floods from April to June, the middle reaches from March to May, and the downstream reaches from February to May. Because of the longer season in the downstream areas, the risk of flooding and landslides is much greater for these communities[163].

[156] Jacob P. 9 October 2016. "Global warming imperils Tajikistan's landscape". Aljazeera. Available at: https://www.aljazeera.com/news/2016/10/global-warming-imperils-tajikistan-landscape-161009175837236.html [accessed 03.07.2018].
[157] WFP 2017 Climate Risks and Food Security.
[158] Committee for Emergency Services (CoES). 2018. Statistical damages data for 1998–2014. Provided by the UNDP DRMP.
[159] Ibid.
[160] Hydromet 2018 Assessment of KRB, Unofficial document.
[161] Further information concerning the KRB's vulnerability to extreme climate events is presented under 'Climate change context'.
[162] Tajikistan's agro-ecological zone are classified according to elevation, with the lower zones (1 and 2) primarily being used to grow irrigated crops such as cotton and sub-tropical fruit. Zones of higher elevation (3 and 4) are primarily rain-fed agriculture and used primarily for pasture land and for growing wheat, barley and Lucerne.
[163] Hydromet 2018 Assessment of Kofirnighan River Basin.

Many of the households located in the six most vulnerable districts of the BKRB are located in hazardous areas and experience a number of climate-related threats and disaster events including: i) floods; ii) mudflows; iii) landslides; iv) rockfalls; and v) avalanches[164]. In addition to increased exposure to climate-related threats, these are all rural communities with limited adaptive capacity because of their dependence on agriculture for livelihoods, and limited opportunities for alternative income. About one-third of the agricultural losses in Tajikistan are currently attributable to climate change and variability[165], meaning that communities in the KRB who rely on agriculture for income are extremely vulnerable to the current and future impacts of climate change.

The impacts of climate change are likely to be different in the northern sub-basin of the KRB to those in the southern sub-basin. Rural communities in the Vakhdat, Faizobod and Varzob districts are expected to become increasingly exposed to hydrometeorological hazards such as increased flooding, landslides and GLOFs. In particular, the steep terrain in these areas increase the likelihood of sudden onset multi-hazard risks, such as landslides occurring directly after a GLOF or similar flooding event. Concomitantly, watersheds in the northern sub-basin are frequently degraded as a result of unsustainable land-use practices that increase the likelihood and impact of the above-mentioned risks. Such unsustainable practices also increase the rate of erosion and soil loss, which compromises agricultural productivity in these regions and increases flood risk in downstream areas.

Communities in the Nosiri Khusrav, Kabodiyon and Shaartuz districts, conversely, are increasingly exposed to slow onset hazards such as drought and river bank erosion. In these areas, water availability is the greatest threat to livelihoods. Water availability is limited by poorly functioning irrigation supply infrastructure. This infrastructure is being damaged by: i) high levels of sedimentation from water-borne and wind-borne sediment; and ii) floods in the Kofirnighan River that damage irrigation dams and canals. Floods in the Kofirnighan River also cause riverbank erosion that results in the loss of arable land.

Future climate projections and scenarios

Climate models, developed during the preparation of the Third National Communication, project a number of negative impacts from climate change[166,167]. Specifically, rising temperatures and an increase in intensity of rainfall events have been predicted (Figure 7).

Average temperatures in Tajikistan are projected to increase by 2.9°C by 2050[168]. By the end of the 21st century, temperatures are projected to further increase in the: i) southern districts of the country (including the districts of Nosiri Khusrav, Kabodiyon and Shaartuz); ii) mountains of central Tajikistan (including those in the KRB); and iii) the mountains of the western Pamir.[169] In addition, diurnal temperature ranges and the occurrence of heat waves are predicted to increase, most notably in the country's southern lowlands. These temperature changes will exacerbate glacial and permafrost melt[170]. Glacial cover is projected to reduce by 15–20%, with most small glaciers predicted to disappear in 30–40 years. Ultimately, it is expected that reduced glacial cover will reduce the renewable water resources of Tajikistan.

[164] Further information concerning district-specific vulnerability to extreme climate events is presented under district descriptions.
[165] NHDR 2012 Tajikistan: Poverty in the Context of Climate Change.
[166] The climatic models used were the CCSM3, ECHAM5 and CSIRO.
[167] WFP 2017 Climate Risks and Food Security.
[168] Third National Communication 2014.
[169] Ibid.
[170] Dusik J & Sheraliev B. 2016. Strategic framework for developing and prioritizing climate change adaptation initiatives in the agricultural sector in Tajikistan. Technical Report. Research Gate.

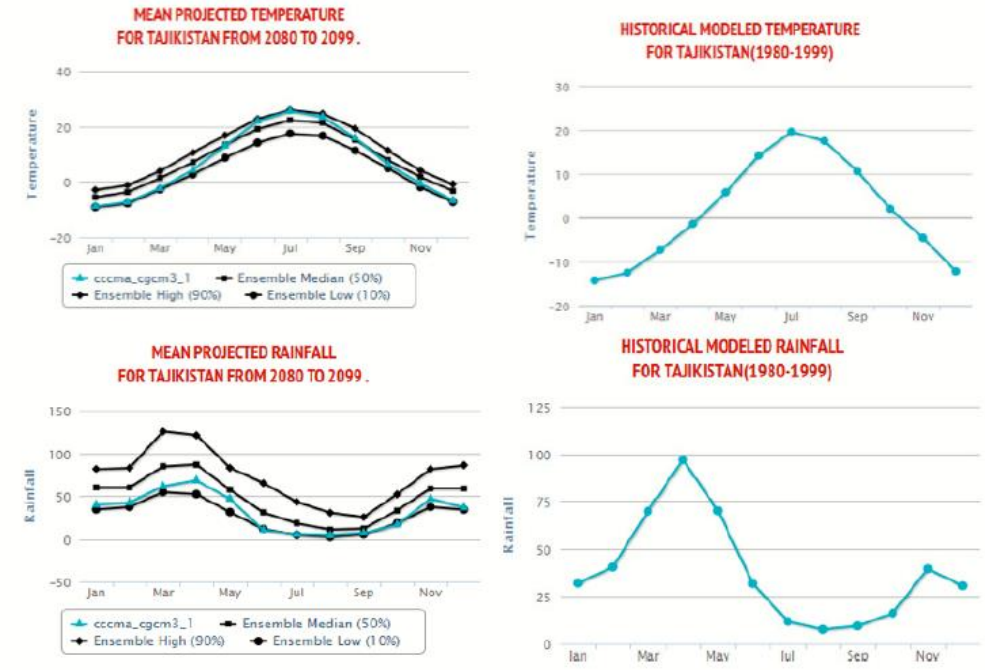

Figure 7. Projected mean temperature and rainfall for 2080–2099 against historically-modelled data for 1980–1999[171].

No significant change in mean annual precipitation is predicted by 2050 in Tajikistan[172]. However, precipitation patterns will continue to change, resulting in[173]:

- an increased variation in maximum and minimum precipitation levels;
- wetter summers and drier winters, causing both flooding and prolonged periods of drought; and
- an increased rainfall intensity.

These climatic changes will have negative impacts on climate-sensitive sectors, including agriculture, water, energy and transport. For example, a decrease in dry-season water availability will adversely affect the agricultural sector, which in turn increases the risk of food insecurity in the country. Decreasing water availability is also likely to result in a climate change-induced migration of farmers to areas with improved water access. This shift in the population would result in an increase in the number of people living in areas exposed to extreme climate events such as floods and landslides[174]. It is predicted that by 2050, ~77% of the country population will be living in areas with considerable exposure to extreme impacts of climate change[175].

Climate change has had negative and lasting impacts on different sectors in Tajikistan. An overview of these impacts on the agricultural, water and energy sectors is provided in the sub-sections below.

Agriculture

The predicted decrease in agricultural yields as a result of decreasing water availability and soil loss will directly impact ~2 million people in Tajikistan[176]. Agricultural yields are predicted to decline by as much as 30% by 2100[177],

[171] WFP 2017 Climate Risks and Food Security.
[172] Dusik & Sheraliev 2016 Strategic framework for developing and prioritizing climate change adaptation.
[173] WFP 2017 Climate Risks and Food Security.
[174] NCCAS 2016.
[175] World Bank (WB). 2013. Tajikistan – Overview of Climate Change Activities. World Bank. Washington, DC.
[176] WB 2013 Tajikistan – Overview.
[177] Schellnhuber HJ, Reyer C, Hare B, Waha K, Otto IM, Serdeczny O, Schaeffer M, Schleußner CF, Reckien D, Marcus R & Kit O. 2014. Turn down the heat: confronting the new climate normal. The World Bank. Washington, DC.

which is likely to result in rising food costs[178,179]. This will cause an increase in poverty levels and a decline in food security in the country[180].

Coupled with a decrease in water availability, increasing temperatures will result in greater crop evapotranspiration rates. Farmers will consequently need to alter their planting and harvesting practices to accommodate longer growing seasons while managing reduced water availability for agriculture use. Reduced water supplies in the drier regions of the country are expected to result in major economic losses for farmers[181].

Water and energy

Tajikistan's energy production and transmission are predicted to be negatively impacted from changes to precipitation regimes. Energy and water systems are interconnected and therefore any changes in precipitation amounts or an increased drought risk has the potential to adversely affect energy production and supply to the population. For example, changes in river flow and increasing erosion are likely to impact hydroelectric production capacity, while reduced availability of water is likely to increase energy costs for pumping water[182].

Adaptation gaps in Tajikistan

Currently, there are a number of gaps that hinder the effective implementation of climate change adaptation in Tajikistan. Many of these gaps are related to limited institutional and technical capacity for the implementation of adaptation projects to develop the climate-resilience of Tajikistan communities.

Importantly, there is no targeted, national climate change adaptation policy in place in Tajikistan. The two primary national strategies that guide development in the country currently do not include climate change and adaptation. These strategies are the 'National Development Strategy for the Republic of Tajikistan for the period up to 2030' (NDS)[183] and 'Mid-term Development Programme 2016–2020' (MTDP)[184,185]. To address this gap, development of the National Climate Change Adaptation Strategy Tajikistan (NCCAS)[186] began in 2016 with a focus on building capacity within the country for climate resilience. The NCCAS is currently in draft form and has yet to come into effect, however the strategy preliminarily highlights the following as focal points[187]:

- existing laws, regulations, and codes on environmental protection, energy, drinking water supply, construction, and disaster risk management do not incorporate climate change; and
- policy, strategy, and legislative environments do not incentivise governments to reduce vulnerability and pursue adaptation measures.

In additional to the NCCAS, the Agricultural Reform Programme for 2012–2020[188] lists 'developing agricultural technologies for climate-change adaptation and resilience' as one of 22 specific objectives in Tajikistan[189]. However, there is little acknowledgement of climate change challenges in other sectoral policies, including water and health. This limited mainstreaming is compounded by a lack of clear, institutional responsibilities and governance for land and water management at a catchment level. The absence of a cross-sectoral approach to climate change adaptation poses a significant barrier to integrated, landscape-level, adaptive planning.

[178] Heltberg R, Reva A & Zaidi S. 2012. Tajikistan: Economic and Distributional Impact of Climate Change. World Bank Knowledge Brief #50. World Bank. Washington, DC.
[179] World Health Organisation (WHO) Europe. 2009. Protecting health from climate change in Tajikistan. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).
[180] NCCAS 2016.
[181] Ibid.
[182] NCCAS 2016.
[183] National Development Strategy for the Republic of Tajikistan for the period up to 2030 (NDS). 2016. Republic of Tajikistan, Dushanbe.
[184] NDS 2016.
[185] Poverty Reduction Strategy for the Republic of Tajikistan for 2010–2012 (PRS). 2010. Republic of Tajikistan, Dushanbe.
[186] NCCAS 2016.
[187] Ibid.
[188] Agricultural Reform Programme for 2012–2020 of the Republic of Tajikistan. 2012. Ministry of Agriculture, Government of Tajikistan.
[189] World Health Organisation (WHO). 2012. Policy – Program on Agricultural Reform 2012–2020/Program of Reforming of Agriculture of the Republic of Tajikistan for 2012–2020. Global Database on the Implementation of Nutrition Action (GINA). Available at: https://extranet.who.int/nutrition/gina/en/node/14962 [accessed 11.07.2018].

In 2015, the GoT took steps to shift towards managing water resources according to hydrographic rather than administrative boundaries[190]. The Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme) aims to promote the implementation of Integrated Water Resources Management (IWRM) at the basin level. Through the programme, River Basin Organisations (RBOs) and River Basin Councils (RBCs) will be established in each of the six identified basins in the country, as well as in sub-basins, where required. RBOs will mainly be responsible for: i) planning the use and protection of water resources annually and in the long-term; and ii) monitoring the distribution of water as well as the state of rivers. Concurrently, RBCs will mainly be responsible for reviewing the plans developed by the RBOs and managing interactions with stakeholders such as water users and Water User Associations (WUAs). RBOs are expected to become operational in 2019, with the GoT being expected to allocate ~US$160,000 annually towards the operation of RBOs and RBCs. While the Water Reform Programme is likely to modernise water management in Tajikistan, it does not adequately consider the impacts of climate change on the water sector. While climate change impacts are acknowledged to impact water resources, the extent of these impacts is not well understood – particularly at the river basin level. Furthermore, the focus of the Water Reform Programme is restricted largely to water resources management and does not adequately consider the impacts of multiple hazards at the river basin and watershed level. While flood management will be the responsibility of RBOs, other climate-linked hazards such as erosion and landslides are not addressed through the programme[191].

The latest version of the PRS, the 'Living Standards Improvement Strategy of Tajikistan for 2013–2015' (LSIS)[192], is one of the first non-ecological strategy documents to acknowledge climate change as a threat to development in the country. This acknowledgement has been in response to the reliance on agricultural productivity and disaster risk information from previous hydrometeorological events, including glacial melt. The most recent NDS, for the period 2016–2030[193], reflects the significance of climate change as a barrier to achieving the desired development goals for the country by 2030.

Climate change expertise currently only exists within a limited number of institutions in Tajikistan, most notably the State Agency for Hydrometeorology (Hydromet) of the Committee for Environmental Protection (CEP). Within these institutions, specialists have either specific skills (e.g. meteorologists, hydrologists) or broader knowledge (e.g. environment, water management) related to climate change and its impacts. As a result, the staff employed by these institutions do not have the technical capacity to recognise the need for climate change adaptation and implementing necessary measures for it.

Since the early 1990s, climate and agricultural research in Tajikistan has been critically underfunded which has resulted in limited scientific capacity. Financial resources are limited and researchers are poorly remunerated[194]. The former capacity building and reward systems that functioned under the Soviet Regime are no longer in place, while the existing culture of centralised decision-making limits initiative and innovation.

Moreover, limited recruitment of young researchers has resulted in a cohort of scientific professionals reaching retirement age. Furthermore, limited contact with the international scientific community, and limited English language skills, have resulted in a technology lag which, in turn, has prevented scientists from keeping abreast of scientific advances. Indeed, only recently have initiatives such as the University of Central Asia (UCA) and the Central Asia and the Caucasus Association of Agricultural Research Institutions (CACAARI) have been established in Tajikistan. A brief description of each of these initiatives is outlined below.

- The **UCA** is an internationally chartered not-for-profit secular institution. It was formed as a partnership between the governments of Kazakhstan, the Kyrgyz Republic and Tajikistan under the sponsorship of the Aga Khan Development Network (AKDN). Founded in 2,000, its first campus opened in 2016 in Naryn, Kyrgyzstan and offers five-year undergraduate programmes in Computer Science (BSc) and

[190] Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme). 2015. Resolution of the Government of the Republic of Tajikistan. Unofficial translation.
[191] Water Reform Programme 2015.
[192] Living Standards Improvement Strategy for the Republic of Tajikistan for 2013–2015 (LSIS). 2013. Republic of Tajikistan, Dushanbe.
[193] NDS 2016.
[194] Central Asian Countries Initiative for Land Management Multi-Country Support Project (CACILM). 2009. Research Prospectus: A Vision for Sustainable Land Management Research in Central Asia. Sustainable Agriculture in Central Asia and the Caucasus. Regional Office of ICARDA for Central Asia and the Caucasus.

Communications and Media (BA). In 2017 the Khorog Campus in Tajikistan was opened, offering five-year undergraduate programmes in Earth and Environmental Sciences (BSc) and Economics (BA).

- The **CACAARI** was established in 2,000 when leaders of the eight National Agricultural Research Systems (NARS) came together under the aegis of the Consultative Group on International Agricultural Research (CGIAR) Central Asia and the Caucasus (CAC) Program facilitated by the International Centre for Agricultural Research in Dry Areas (ICARDA). The purpose of the organization is to facilitate regional cooperation in agricultural research for development by providing a neutral platform where ideas and experiences can be shared. Moreover, the association acts as a two-way communicative mechanism, supporting information flow between global organizations and local partners. The membership is open to research institutions, universities, NGOs and farmer associations located in Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan[195].

Non-climatic problems

There are a number of non-climatic environmental challenges in Tajikistan that are exacerbating vulnerability to climate change. Such challenges include land degradation, which is compromising and poor water supply[196]. Following the collapse of the Soviet Union in 1991, previously collectivised farms were divided. The disruptions following this division put pressure on Tajik farmers who had become accustomed to collective structures and living within *avlods*[197]. There are now few associations or institutions which support individual farmers, as most present-day state and collective farms work with groups of *dehkan*[198] farmers. A country-wide organisation exists to provide support to the *dehkan* farmers, but small-scale farmers do not benefit significantly from this.

Unsustainable land management practices in Tajikistan – including overgrazing and overploughing on steep slopes – have resulted land degradation, which has been characterised by the reduced productivity of agricultural lands and pastures[199]. These unsustainable land management practices have also compromised the supply of water to the population of Tajikistan, specifically by increasing erosion. Accelerated erosion has resulted in an increase in suspended solid material in the Kofirnighan River. This negatively impacts water supply, as suspended solids damage pumps and other water supply infrastructure. These damages increase the treatment costs for producing potable, industrial and irrigation water.

Further to the above-described unsustainable land management practices, the quality and quantity of water in Tajikistan has been affected by deforestation. Firstly, and as with overgrazing and overploughing, deforestation has caused increased erosion in several river basins in the country, including in the KRB. Trees are important for sustaining ecosystem functions in the following ways: i) the high infiltration rate in forests reduces the incidence of surface runoff and reduces erosion transport; and ii) the binding effect of tree roots enhances slope stability, which reduces erosion. Hence, with deforestation, these ecosystem functions are being compromised. Secondly, deforestation has also impacted river flows in Tajikistan and within the KRB. Because trees regulate river flows (specifically through promoting transpiration and infiltration), deforestation in Tajikistan has led to water deficits (droughts) during the dry season and water excesses (floods) during the wet season. With the combined effects of erosion and compromised river flows, deforestation is severely impacting the hydrological functioning in the KRB as well as in river basins throughout Tajikistan.

Problem statement

The problem to be addressed by the proposed project is that the livelihoods of small-scale rural farmers and pastoralists in the Kofirnighan River Basin (KRB) of Tajikistan are being negatively affected by climate change. Rising temperatures and extreme climate events, including floods and droughts, are resulting in: i) damages to crops; ii) increased rates of soil erosion and concomitant declines in agricultural productivity; and iii) damages to properties and infrastructure. These effects are greatly exacerbated by a baseline situation of unsustainable management of land and water resources in the KRB. Future prospects for rural communities in this river basin

[195] CACAARI. 10 February 2017. Meeting of the GFARC Steering Committee. Available at: http://www.cacaari.org [accessed 23.07.2018].
[196] World Bank Group (WBG). 2008. Tajikistan: Country Environmental Analysis. Washington, DC.
[197] an extended patriarchal family that serves as an informal mutual support structure
[198] A *dehkan* farm is a term for an individual or family farm in Central Asia.
[199] WBG 2008 Tajikistan: Country Environmental Analysis.

are limited, with their livelihoods expected to be further threatened as climate change impacts intensify, making sustainable management of their natural resources increasingly challenging.

Alternative solution and barriers

Preferred solution

The preferred solution would be for the small-scale farmers and pastoralists within the KRB of Tajikistan to become resilient to climate change impacts. This would be achieved by developing and then implementing a climate-resilient catchment management strategy for the KRB, which will enhance the provision of ecosystem services in the river basin. Such a strategy would promote a wide range of new approaches, including: i) long-term planning at the river basin scale, informed by integrated catchment management principles; ii) explicit consideration of the trends, risks and impacts of extreme climate events and their interactions in catchments of various scales iii) consideration of all landscapes (i.e. urban, pastoral, agricultural as well as conservation areas) within the KRB; iv) the use of ecosystem goods and services under climate change conditions to support climate-resilient livelihoods; v) ecosystem-based adaptation (EbA) interventions, including watershed rehabilitation and sustainable management of all natural resources; and vi) the development of appropriate adaptation responses by communities and relevant public services for both sudden- and slow-onset climatic events.

Barriers

Barriers to implementation of the above solution within the KRB include: i) a lack of coherent climate risk information coupled with limited knowledge sharing within the country; ii) weak institutional structures for developing integrated catchment management strategies; iii) limited technical capacity of public services to promote climate change adaptation among communities; and iv) limited knowledge among communities of the benefits of EbA. The activities within the project are designed to overcome these barriers and are detailed in Part II[200].

Barrier 1. Lack of systematic production, collection and sharing of climate risk information.
A wide range of projects and programmes have been conducted in river basins across Tajikistan, which have assessed the impact of various environmental and socio-economical factors on the population. However, most of these initiatives have not accounted for climate change and its associated risks, resulting in these risks not being included in basin-level planning and management.

For example, a management plan is in development for the KRB[201], but does not take an integrated approach to landscape planning and will not include climate risk projections.

The relevant climate information authority in Tajikistan, Hydromet, also lacks the necessary capacity to measure and collect climate risk information. In the KRB, three of the major hydrological stations[202] have been identified as having poor performance, with equipment that is poorly maintained. This limitation has resulted in communities in the KRB not receiving advanced climate risk information on events such as flooding or landslides.

An additional limitation is that all information and data being generated on climate and climate change in the country are not currently being housed in a well-managed and accessible information centre. Although centres for storing such information do exist in Tajikistan in the form of hubs or platforms, the relevant institutions do not benefit from the services provided by such centres. Relevant centres include the Open Centre being hosted by the Department of Geology and an information centre being established by the Ministry of Water and Energy. These centres are still in a nascent stage, with a limited capacity for information production, management and sharing. As a result, information on climate risks is not available on a central, readily accessible platform.

[200] Part II: A, where details on the project components, outcomes, outputs and activities are provided.
[201] The KRBMP is being developed by Fergana Valley Water Resources Management and is to be completed in 2019. Further details are presented in the environmental context sub-section.
[202] These three stations are the Tartki and Chinar on the Kofirnighan River and Romit on the Sardai-Miyona River.

With the limited sharing of existing knowledge within the country on climate change risks, there is a significant gap in available knowledge on appropriate adaptation interventions. Specifically, rural Tajik communities have limited or no access to information on climate risks and appropriate adaptation practices.

The proposed project will overcome the above barrier in the KRB by: i) strengthening the collection of climate data through rehabilitating identified hydrometeorological stations in the KRB (Outcome 1); and ii) supporting existing knowledge management platforms to improve the systematic collation and sharing of climate knowledge (Outcome 3).

Barrier 2. Limited institutional capacity to include climate change adaptation into river basin management plans and policies, and to apply catchment management approaches to climate risk reduction.
Integrated land and water resource management is particularly relevant under climate change conditions and the associated increase in climate risks. This is because upstream land uses, such as agriculture, affect downstream risks, such as flooding. These interactions between land use and climate risks are complex and not well understood in Tajikistan. This is particularly true for a topographically diverse basin such as the KRB, where both steep mountainous regions and arid lowlands occur. The basin is affected by multiple climate risks but lacks an integrated catchment management approach for the management of such risks.

While a river basin management plan is currently being developed for the KRB under the Water Reform Programme, this management plan will focus on water resources management. Integrated management of land and water resources as well as multi-hazard climate risk management will not be covered by the scope of proposed basin management plan. Consequently, the RBOs and RBCs that will be established in the northern and southern KRB sub-basins will not be capacitated to plan for the implementation of integrated climate risk reduction practices at the basin, sub-basin and watershed scales.

Outcome 1 of the proposed project will overcome this barrier by developing an integrated catchment management strategy for the KRB that will propose measures for adopting a climate risk-management approach. Furthermore, existing co-ordination and training measures will be strengthened to develop the institutional capacity for integrated catchment management. As a result of the outputs under Outcome 1, the GoT will be capacitated to implement specific climate-resilient catchment management throughout the country, beyond the target basin.

Barrier 3. Limited technical capacity of local government to implement adaptation activities that promote climate resilience within local communities.
Local government authorities in the KRB currently lack the knowledge and expertise to monitor extreme climate events, transmit early warning information and take adequate and appropriate response measures to manage climate risks. This limitation results in local KRB communities receiving minimal training and information on climate change adaptation. In particular, public services from local government that provide climate advisories, agricultural extension services and livestock health services do not take climate risks into account. The end result is that local communities: i) are not being regularly updated on local, regional nor international best practices for reducing the impacts of climate change; and ii) are not being made aware of climate risks in time to take adequate action.

The proposed project will overcome this barrier by: i) strengthening the capacity of local government to implement adaptation activities (Outcome 1); and ii) strengthening local communities' knowledge and capacity to implement relevant adaptation measures through local demonstrations.

Barrier 4. Limited knowledge among communities of livelihood benefits from implementing climate risk reduction and EbA measures.
Farmers and pastoralists in Tajikistan have had limited exposure to EbA and its benefits for reducing the impacts of climate change as well as improving livelihoods. This is particularly true for communities in the KRB, where there have been limited climate change projects and initiatives. Consequently, KRB rural community members do not have the technical capacity to implement EbA interventions and are also not incentivised to do so. Because of this limitation in climate change projects and initiatives within the KRB, communities have not been exposed to demonstration plots that showcase the benefits of EbA activities for improving climate resilience. It is also unlikely that rural community members in KRB will autonomously implement EbA interventions because farming practices in the country have shown limited innovation since the end of the Soviet era.

Community knowledge on EbA will be developed through on-the-ground implementations of EbA in degraded watersheds throughout the KRB. Knowledge sharing will be facilitated through Farmer Field Schools (FFS), where community members will have the opportunity to learn local best practices in a locally appropriate manner. Communities will also be engaged through participatory land-use planning to develop Watershed Action Plans (WAPs). These WAPs will guide the systematic implementation of EbA interventions to reduce the vulnerability of rural communities in the KRB.

Project Objective:

The objective of the proposed project is to enhance the livelihoods of the small-scale farmers and pastoralists living in the Kofirnighan River Basin under future climate change conditions. Such conditions are expected to include increased frequencies and intensities of extreme climate events such as intense rainfall, flooding and droughts. Three interrelated outcomes within the project (detailed in Part II[203]) will contribute to achieving this objective, namely: i) catchment management strategy to manage climate risks operationalised at *raion* and *jamoat* levels in the KRB; ii) an integrated approach to building the climate resilience of agro-ecological landscapes operationalised at a village level; and iii) existing knowledge management platforms supported for integrated catchment management and EbA.

The overarching approach of the project is to employ integrated catchment management within the KRB. To this end, a climate-resilient catchment management strategy will be designed for the basin which will enable national rural development planners, local government and local communities to manage a wide range of climate risks. As noted in the introduction of this document, this strategy will be underpinned by the following concepts and principles:

- climate change can cause or exacerbate multiple hazards (e.g. GLOFs, floods, mudflows, landslides, soil erosion and drought), all of which need to be taken into account when designing adaptation measures;
- management of climate risks needs to be tailored for a particular spatial scale (e.g. catchment or watershed);
- there are complex upstream-downstream interactions (involving flooding and erosion processes) that need modelling before effective adaptation interventions can be designed;
- long-term development planning for the KRB will require careful consideration of the multiple hazards associated with climate change;
- a cross-sectoral approach, which takes linkages between sectors (e.g. agriculture, conservation, energy and water) into account, is required for effective adaptation;
- a landscape approach that considers urban environments, rural villages, agricultural fields and all ecosystems (forests, pastures) is critical for managing climate risks in the long-term; and
- adaptation in the KRB will require considerable investment in EbA interventions that increase the supply of critical ecosystem goods and services under conditions of climate change.

With regards to the project's implementation of EbA within the KRB, communities will be trained on EbA interventions for managing pastoral, forest and agricultural landscapes at a watershed scale under climate change conditions. These interventions will follow the principles of sustainable land management (SLM) and climate-smart agriculture (CSA) wherever applicable. The training will be targeted, in particular, at the *raion* (district) and *jamoat* (sub-district) levels. In so doing, the project will enhance support services to villages and enable participatory, local-level planning. The lessons learned from the project will enable a policy and investment framework to be developed for replicating and scaling up EbA interventions across the country. Existing knowledge management platforms and hubs will be used for promoting this replication and upscaling. The project's climate resilient catchment management approach, lessons learned and best practices will inform and contribute to the ongoing process of water sector reform in Tajikistan. As noted above, the country is currently undergoing water sector reform that among other includes the development of the river basin plans and the establishment of the River Basin Organisations (RBOs). The project will closely align with these processes to integrate the EBA methods at the catchment level that are to yield significant water and land management benefits in the face of increasing climate change risks. Integration of the project defined adaptation strategies into the

[203] See Part II: A, which gives a project overview and details the components, outcomes, outputs and indicative activities of the project design.

basin plans and RBO activities will enable replication and upscale. Furthermore, the project will closely coordinate with the National Adaptation Plan (NAP) process that is ongoing with UNDP's support to embed necessary policy measures across all priority sectors for further scale up. As part of this process, adaptation measures will be mainstreamed into four priority sectors (Energy, Water, Transport and Agriculture). Lessons learned and best practices from the Adaptation Fund project will inform the ongoing NAP development process to ensure that project activities and the climate-resilient catchment management approach are scaled up across all basins of the country. Furthermore, the project lessons and the best adaptive practices as well as the project generated climate risk information will also inform the ongoing process of water reform in Tajikistan.

Each of the proposed project's activities have been designed to address the climate change problem described in Part II[204], and to contribute to overcoming the barriers described above.

Project Components and Financing

The duration of the project is proposed to be five years (60 months) beginning in 2020 and ending in 2024.

Table 5 presents the proposed components, expected outcomes, concrete outputs and indicative activities of the project, which are further detailed in Part II[205]. During the development of the Full Proposal, the activities were outlined to ensure their alignment with national target areas. A detailed breakdown of costings per activity is provided in Part III[206].

Table 5. Project components, expected outcomes and an outline of concrete outputs, with component-level grant amounts.

Project Components	**Expected Outcomes**	**Expected concrete Outputs**	**Amount** (US$)
1. Integrated catchment management to build climate resilience.	1. Catchment management strategy to manage climate risks operationalised at *raion* (district) and *jamoat* (sub-district) levels in Kofirnighan River Basin (KRB).	1.1. Multi-hazard climate risk model developed for target watersheds in the KRB.	1,012,000
		1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.	
		1.3. Integrated catchment management strategy developed for the KRB.	
		1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	
		1.5. Payment for Ecosystem Services models developed for the KRB.	
2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.	2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	2.1. Agro-ecological extension services supported at the *jamoat* level to provide technical support for EbA implementation.	7,282,810
		2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target watersheds.	
		2.3. EbA interventions implemented in target watersheds by local communities.	
3. Knowledge management on building climate resilience through integrated catchment	3. Existing knowledge management platforms supported for integrated catchment management and EbA.	3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.	142,500
		3.2 An impact evaluation framework established to enable effective adaptive management of EbA activities.	

[204] See Part II: A, which gives a project overview and details the components, outcomes, outputs and indicative activities of the project design.
[205] Ibid.
[206] See Part III: G, which illustrates the budget and detailed budget notes.

management and EbA in the KRB.			
4. Component sub-total			**8,437,310**
5. Project Execution cost (9.20%)			776,000
6. Implementing Entity Fee (8.5%)			783,131
7. Total Project Cost			**9,996,441**

Projected Calendar

The projected timeline for the proposed project is a five-year implementation from 2020–2024. Estimated milestones are outlined in Table 6.

Table 6. Projected milestones and expected timeline for the proposed project.

Milestones	Expected dates
Start of Project Implementation	January, 2020
Mid-term Review	June, 2022
Project Closing	March, 2024
Terminal Evaluation	June, 2024

PART II: PROJECT JUSTIFICATION

A. *Project components*

To achieve its objective of enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan, the proposed project focuses on strengthening the integrated management of the KRB and implementing concrete on-the-ground EbA interventions. The three components of the project are: i) integrated catchment management to build climate resilience; ii) Ecosystem-based Adaptation, including Climate-smart Agriculture and Sustainable Land Management, in agro-ecological landscapes; and ii) knowledge management on building climate resilience through integrated catchment management and EbA in the Kofirnighan River Basin. The first component will strengthen the institutional and technical capacity of government and local communities to manage climate risks. The second component will support local communities to implement interventions that reduce climate risks by enhancing the ecosystem functionality of degraded watersheds. The last component will compile and disseminate lessons learned for future national and regional upscaling and replication.

The outcomes, concrete outputs and indicative activities under each component are described below.

Component 1. Integrated catchment management to build climate resilience.

The GoT has initiated a water sector reform[207] that will result in water resources being managed according to hydrographic boundaries rather than administrative ones. For the KRB, this will result in the establishment of River Basin Organisations (RBOs) and River Basin Councils (RBCs) in the northern and southern sub-basins by the end of 2019. While this will strengthen the management of water resources throughout the KRB, the KRB Management Plan (KRBMP) that is being developed will not address: i) the linkages between land and water management and the consequent impacts on climate risks; and ii) the importance of an EbA approach to risk reduction at the watershed level. Consequently, Component 1 has been designed to build on the KRBMP that is currently being developed and facilitate climate-resilient integrated catchment management in the KRB.

Outcome 1. Catchment management strategy to manage climate risks operationalised at raion (district) and jamoat (sub-district) levels in Kofirnighan River Basin.

Under this outcome, integrated land and water resources management principles will be introduced to Tajik authorities at the *raion* and *jamoat* levels to effectively address the climate change impacts described in Part I[208]. An integrated, climate-resilient catchment management strategy for the KRB will be developed using a multi-hazard climate risk approach. This strategy will detail the climate risk scenarios in each KRB watershed and will provide the *raion* and *jamoat* government levels with guidelines for managing these risks. This will enable climate-resilient land-use management in the KRB.

Outcome 1 will be achieved through five linked outputs. These outputs will: i) contribute towards improved transparency on multi-hazard climate risks throughout the KRB through risk modelling and improved climate data production; ii) develop a cross-sectoral strategy for managing these risks throughout the KRB by using an integrated catchment management approach; iii) strengthen the capacity of government bodies and local communities for managing climate risks by implementing EbA; and iv) incentivise ecosystem management as a risk management approach by developing a framework for a Payment for Ecosystem Services (PES) approach.

Output 1.1. Multi-hazard climate risk model developed for vulnerable watersheds in the Kofirnighan River Basin.

A gap analysis will be conducted based on all available information that covers the KRB, including baseline projects and the ongoing assessment being conducted as part of the KRBMP[209]. It is expected that the outputs of the KRBMP will include watershed delineation for the KRB, as well as information on water scarcity at the watershed level. However, it is not expected to include information on risks related to water access and climate

[207] Water Reform Programme 2015.
[208] See Part I: Project Background, on the climate change context in Tajikistan.
[209] scheduled to be completed in 2019

change impacts on basin hydrology. The gap analysis will inform the identification of watershed-level risks to be prioritised for the north and south sub-basins of the KRB.

Under this output, priority risks, which will include flooding and landslides, will be modelled at the watershed level for the north and south KRB sub-basins. For climate-specific risks – which also include floods, landslides and droughts – downscaled climate predictions will be included in the risk models. These models will inform the development of cohesive Multi-Hazard Climate Risk Models (MHCRMs) for the KRB.

The MHCRMs will be used to inform the development of detailed Watershed Action Plans (WAPs) under Outcome 2. In addition, the models and their results will be archived and disseminated through knowledge centres that will be supported under Outcome 3.

Indicative activities to be implemented under Output 1.1 are detailed below.

Activity 1.1.1. Conduct a gap analysis on existing risk information in the Kofirnighan River Basin.

A detailed gap analysis will be conducted on the KRBMP. The analysis will be informed by existing information on *inter alia*: i) the vulnerability of the KRB; ii) baseline projects in the KRB and surrounding regions; iii) the ongoing assessment for the development of the KRBMP[210]; and iv) water availability in the KRB. The collation of data on water availability will support the assessment of identified climate risks[211] as well as producing the climate change projections that will inform the MHCRMs [Activity 1.1.3[212]].

The gap analysis will take into account all recommendations and watershed delineations made through the KRBMP assessment. If the assessment does include watershed delineations, the design of the integrated catchment management strategy for the KRB will refer to those delineations.

Once the gap analysis has been completed, missing primary data will be collected for the KRB. Satellite imagery will be used to obtain land use, vegetation cover and slope data. Where existing data on soils is limited, ground-truthing studies will be conducted. For watersheds that are expected to be particularly vulnerable, satellite imagery will be supplemented with topographic models derived from high-resolution drone imagery.

To accurately consider the impacts of climate change on the risk profile of the KRB, regional climate change predictions will be downscaled. These downscaled predictions will be used in Activity 1.1.2 to inform the climate risk models.

Activity 1.1.2. Develop Multi-Hazard Climate Risk Models for the Kofirnighan River Basin.

Multi-Hazard Climate Risk Models (MHCRMs) will be developed at the watershed scale for the KRB. These models will be calibrated with historical data, but will also be run using downscaled climate change predictions developed under Activity 1.1.1. Notably, multi-hazard models will consider the relationships between different types of hazards. In many cases, the onset of one hazard alters the likelihood or impact of another hazard. For example, a GLOF may result in river bank destabilisation that could trigger a landslide event. Similarly, landslides and other forms of mass movement may alter river morphology and increase the risk of flooding. These interactions may be closely linked temporally and spatially (e.g. a GLOF triggering a landslide). Conversely, some hazards may interact across larger temporal and spatial scales; for example, rapid erosion upstream in a catchment may result in downstream sediment accumulation, which slowly increases downstream flood risk.

In this activity, priority hazards such as GLOFs, floods, mudflows and landslides will be modelled for the KRB. While different priority risks have been identified in both the north and south sub-basin of the KRB, the vertical linkage between the two regions will markedly impact the risk profile. In particular, land uses in the northern sub-basin (upstream area), will have impacts on the southern sub-basin (downstream area) risk profile. For example, inappropriate land uses in the upstream areas could result in increased sedimentation, erosion and landslides,

[210] scheduled to be completed in 2019
[211] Validation of the identified climate change risks for the KRB is being conducted under Activity 1.1.2.
[212] Use of square brackets is specifically to highlight linkages between outcomes, outputs and activities.

as well as reduced dry season water availability, in the downstream areas. Conversely, upstream land uses that maintain the ecosystem functionality of watersheds will result in downstream benefits of drainage control, flood reduction, improved water quality and increased dry season water flow.

Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.

Currently, there are 11 weather stations across the KRB, which equates to an approximate density of one station per 1,000 km^2. This is regarded as an appropriate density[213,214] according to WMO guidelines[215]. Notwithstanding this, existing weather stations throughout Tajikistan face technical challenges, limited automation and problems regarding data quality. In addition, weather stations are being degraded because of insufficient resources and technical capacity to rehabilitate them following extreme climate events.

Under this output, the State Agency for Hydrometeorology (referred to hereafter as 'Hydromet') will be supported by providing capacity building to repair existing weather stations in the KRB. Support to Hydromet will also be provided in the form of equipment for the rehabilitation and upgrading of selected weather stations. This support will improve the quality and quantity of hydrometeorological data that is collected from the weather stations. Collected data will contribute to building an in-depth understanding of the climate change risks on different soil types and land units. The data will also be used to: i) refine the MHCRMs (Output 1.1); and ii) deliver climate risk information and adaptation advisories to agro-ecological extension service providers (Output 2.1). Weather data will be disseminated under Output 3.1.

Indicative activities to be implemented under Output 1.2 are detailed below.

Activity 1.2.1. Provide technical support for the modernisation of automated weather stations in the most vulnerable districts of the Kofirnighan River Basin.

In order to provide relevant and up-to-date climate risk information and associated advisories for rural farmers and pastoralists in KRB, weather stations need to be regularly updated. In addition, following extreme climate events, weather stations should be inspected for potential repair needs. Existing weather stations within the KRB, although regarded as operational, are in need of rehabilitation. This is in response to limited resources for regular inspections following extreme climate events that have resulted in the stations undergoing significant wear and tear[216].

Of the 11 total weather stations in KRB, 3 have been identified for rehabilitation and modernisation, namely 'Tartki' and 'Chinar' situated on the Kofirnighan River, and 'Romit' on the Sardai-Miyona River. The rehabilitation will ensure that the three stations are capable of procuring a greater density of data required for the climate projections for their respective areas.

Hydromet will be supported through this activity by providing training to relevant technical personnel on the ongoing maintenance of weather stations, as well as repairs following extreme climate events. In addition, required equipment will be provided to Hydromet under this activity to rehabilitate the existing three identified weather stations. Support will also be provided to install stream gauging equipment. This equipment will include sensors to automatically measure stream velocity, depth, width and water turbidity, as well as supporting infrastructure. Supporting infrastructure will include cabling, observer cabins and electric drum winches (details of hydrometric equipment are presented in Annex 5).

Activity 1.2.2. Collect and collate data from improved automated weather stations.

[213] Third National Communication 2014.
[214] World Meteorological Organization (WMO). 2008. Guide to Meteorological Instruments and Methods of Observation. Seventh Edition, WMO-No. 8.
[215] World Meteorological Organization (WMO). 2018. Country Profile Database: Tajikistan Regional Association II (Asia). Available at: https://www.wmo.int/cpdb/tajikistan [accessed 19.07.2018].
[216] Currently, KRB weather stations frequently collect unreliable or insufficient data. Therefore, high-quality climate information cannot be disseminated to the respective end-users. Automated data collection protocols will be implemented at all weather stations in the KRB and suitable data management software will be acquired. This software will ensure that data collected by weather stations is accurate and that all data is safely stored.

All data and information from both existing and supported automated weather stations [under Activity 2.1.1] will be collected. This data will be collated for dissemination through the existing knowledge centres in the country [Outcome 3] for analysis and further dissemination in usable formats. In addition, historic records dating back 100 years will be digitised.

To date, data collected from weather stations have been digitally archived through the process of scanning written records. However, this data is not usable for the necessary analysis that should take place in order to inform climate risk projections because it is in image format. In light of this shortfall, this activity will involve using Intelligent Character Recognition (ICR)[217] software to automatically convert scanned images into machine-readable data. This will significantly improve the historical weather records for the KRB and will be considered an innovative advance in climate data management capability in the country.

Activity 1.2.3. Use collected data to inform climate risk information and adaptation advisories for agro-ecological extension service providers.

The collected and collated data from available automated weather stations in the KRB [under Activity 2.1.2] will be fed into the existing knowledge management centres supported under Outcome 3. This data will then be used to develop climate risk and advisories for farmers and pastoralists. Adaptation advisories will be tailored to the local needs based on the collected data as well as existing climate forecasting for the country. Mobile service providers will be engaged with to identify partners for the long-term and to ensure sustainability of advisory delivery. Advisories will be disseminated to all agro-ecological extension service providers in KRB so that they are able to make informed decisions on adaptation recommendations.

By developing and disseminating advisories, the adoption of climate-resilient and high market-value crop and seed varieties will be promoted. These seed varieties include Lucerne (*Medicago sativa* L.) and sainfoin (*Onobrychis viciifolia* Scop.)[218]. Not only will advisories inform the selection of crops that take climate risks into account, they will inform alternative agricultural options for communities. Such options could include introducing fodder production into agricultural practices and establishing agroforestry and intercropping practices. The introduction of alternative land-use options will result in increasing soil fertility and conservation of natural resources for valuable ecosystem services for future seasons[219].

Included in the advisories will be guidance on planting time and season specific to the target areas. The guidance will include suggested crop types, timing of planting and reason for selection.

Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.

Under Output 1.3, an integrated catchment management strategy will be developed for the KRB. This strategy will outline how to implement integrated land and water resources management in watersheds throughout the KRB in order to manage climate risks. The strategy will address the linkages between upstream and downstream impacts at the river basin scale and outline approaches for identifying and managing such impacts at the watershed scale.

The integrated catchment management strategy will further inform the KRBMP that is currently being developed. RBOs and RBCs in the KRB will be closely involved in the development of the strategy. Staff from RBOs and RBCs, along with relevant staff from CEP, Agency for Land Reclamation and Irrigation (ALRI) and local government at *raion* and *jamoat* levels will be trained on the implementation of the strategy. Strategic approaches and objectives of the strategy will be operationalised at *raion* level through District Development Plans (DDPs).

Indicative activities to be implemented under Output 1.3 are detailed below.

[217] ICR is an advanced optical character or handwriting recognition software system that enables different fonts to be learned by a computer. This system has been used to improve accuracy and recognition levels within data collection and analysis.
[218] FAO. 2008. State of Plant Genetic Resources for Food and Agriculture (PGRFA) in the Republic of Tajikistan: Country Report. By Prof. Dr Hafiz Muminjanov, Dushanbe.
[219] FAO 2008 PGRFA: Country Report.

Activity 1.3.1. Develop an integrated catchment management strategy for the Kofirnighan River Basin to inform and facilitate cross-sectoral landscape planning.

This activity will build on the training provided under Activity 1.3.2 to develop an integrated catchment management strategy for the KRB. Relevant government authorities will be included in the design of the strategy to ensure that it is coherently linked with existing sectoral and local level policies. The strategy will detail how the identified climate risks [under Activity 1.1.2] will be managed using a cross-sectoral approach to integrated catchment management. The strategy design will consider all relevant individual sector mandates and align their objectives within the context of integrated management for the KRB.

Based on the MHCRMs [developed under Output 1.1], the strategy will provide guidance on risk management at various catchment scales within the KRB. This means that factors such as soil erosion and flood risk will be incorporated into cross-sectoral land-use planning to facilitate efficient management across all relevant government sectors. These sectors include *inter alia* water, environment, agriculture, and education.

The strategy will provide overall guidance for the integrated management of watersheds by local communities. This guidance will ensure that WAPs developed under Outcome 2 take downstream impacts into consideration and that interactions between different watersheds are accounted for in a strategic manner.

Activity 1.3.2. Deliver a training programme on mainstreaming climate risks for integrated catchment management planning.

Relevant government and academic staff, of which at least 30% will be women, will be trained on mainstreaming climate risks into integrated catchment management planning. Identified agencies include CEP, Hydromet, MEWR, ALRI, the Department of Geology (DoG), RBOs of the KRB and UCA. Additional agencies and entities to be trained will be identified during the project inception phase. These partners will be trained on international best practices for integrating climate risks into integrated catchment management. In addition, this training will include identifying relevant risk management measures for existing and emerging climate risks. The overall objective of the training programme will be for relevant institutions, government levels and departments to effectively implement an integrated catchment management strategy for managing the impacts of climate change.

Trainings will be tailored to the specific needs of the department/institution to ensure that all partners acquire equal knowledge on the most appropriate mechanism for integrated management. All relevant sectors will be included to ensure that – although mandates will continue to differ slightly – the goals of each align with the strategy for the KRB.

Sub-activities for the trainings under Activity 1.3.2 are outlined below.

- 1.3.2.1. Training conducted to relevant CEP representatives to integrate catchment management into implementation and monitoring activities for all projects going forward, both those with a focus on climate change and without.
- 1.3.2.2. Training provided to the personnel of the supported knowledge management centres – including the DoG Open Centre and to UCA – on assessing available climate risk information and ensuring it is all made available through the relevant portals/hubs.
- 1.3.2.3. Training provided to *raion*-and *jamoat*-level government departments on integrated catchment management and identifying climate risks that require such a management approach.

Activity 1.3.3. Provide training for selected communities on identification of EbA activities and implementation.

Rural communities across the six identified most vulnerable districts of the KRB will be selected for training on identifying and implementing appropriate EbA interventions. These identified six districts include Vahdat, Varzob and Faizobod Districts in the north of the KRB and Nosiri Khusrav, Shaartuz and Kabodiyon Districts in the south of KRB[220]. From these districts, it is expected that communities in ~100 villages across 14 *jamoats* will benefit from training on EbA interventions. Women will be encouraged to participate in these training activities, and of the total number of community members trained, at least 30% will be women.

[220] Details on these six districts are provided in Part I, where the environmental context of Tajikistan is described.

The selected communities will be trained by representatives from those institutions trained under Activity 1.3.2, including district and *jamoat* representatives of CEP. This training-of-trainers (ToT) approach will build the capacity of selected communities to identify climate risks, and to design and implement appropriate EbA interventions. All trainings will be delivered in local Tajik dialects specific to each target district. This will ensure that trainings are accessible to all participants.

Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.

Relevant co-ordination and training mechanisms will be strengthened for the implementation of integrated climate-resilient catchment management. Co-ordination structures to be strengthened include the RBOs and RBCs in the KRB. These entities are currently being established and, by project inception, will have been capacitated on water management at the catchment level. The proposed project will build their capacity on climate-resilient catchment management that includes land use as well as the management of water resources under climate change conditions. Training on cross-sectoral management will be provided to RBOs and RBCs in the KRB, as well as *raion* and *jamoat* level staff. This training will strengthen the existing coordination structures in the KRB to include integrated and climate-resilient management of land and water resources.

Opportunities for establishing/supporting existing local training mechanisms will be identified. Currently, no institutionalised or systematic training mechanisms exist for farmers and pastoralists.

Indicative activities to be implemented under Output 1.4 are detailed below.

Activity 1.4.1. Strengthen existing training mechanisms at the *raion* and *jamoat* levels.

Under this activity, existing training programmes will be strengthened at the *raion* and *jamoat* government and administration levels. The programmes will be adopted from existing mechanisms within the *raion* and *jamoat* government for targeted catchment and/or watershed management. Improved training programmes will include coordination mechanisms for integrating holistic landscape management practices through the integrated catchment management strategy [Output 1.3]. Trainings will be coordinated between the RBOs and RBCs to ensure that the process of continued training is adopted into regular management within the government.

Activity 1.4.2. Provide training on integrating EbA into catchment management.

Following on from Activity 1.4.1, the strengthened training programmes will be carried out for *raion* and *jamoat* level government officials in the targeted districts[221]. The training will focus on providing support for agro-ecological extension services and will include EbA measures as part of an integrated approach to management. Main recipients of this training will include RDPP, CEP and *jamoat* government-level officials to ensure that the administrative and organisational processes are strengthened for EbA implementation.

This training will be linked with activities under Output 2.1 where community demonstration plots of EbA interventions will be established [under Activity 2.1.2] and farmer field schools will be conducted [under Activity 2.1.3]. All trainings will be delivered in local Tajik dialects specific to each target district. This will ensure accessibility to all willing and necessary participants.

Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.

Payment for Ecosystem Services (PES) has been identified as a viable approach for conserving the supply of ecosystem goods and services of Tajikistan under climate change conditions. Currently, no viable models for PES have been identified in the KRB. However, there are a number of ecosystem services within the KRB that could be eligible for a PES approach. These include water provision, flood reduction, sediment retention and

[221] Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon Districts.

biodiversity conservation. The activities of this project will support the delivery of the above ecosystem services and, consequently, the possibility of implementing PES in the KRB will be investigated under this output.

Activity 1.5.1. Develop suitable Payment for Ecosystem Services models for the KRB.

Under this activity, appropriate PES models will be developed for the KRB. Relevant ecosystem services will be identified, such as water provision from restored and ecologically-sound watersheds. Willing buyers and willing sellers for each ecosystem service will be identified and engaged with to determine: i) the feasibility of PES for a particular ecosystems service; and ii) pricing structures for PES-compatible ecosystem services. Where willing buyers and willing sellers of a particular ecosystem service have been identified, potential intermediaries will be engaged with. Intermediaries may include government entities, NGOs and financial institutions. Negotiation platforms will be established between buyers, sellers and intermediaries to determine prices and payment methods for the delivery of ecosystems services.

Component 2. Ecosystem-based Adaptation, including Climate-smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.

Adaptation measures such as EbA are increasingly being recognised as a cost-effective approach for building the climate resilience of vulnerable communities. In the context of watersheds, EbA interventions are most effective when implemented in degraded landscapes. In the KRB, many watersheds are degraded because of unsustainable land management practices – such as overgrazing and deforestation – and the impacts of climate change. These watersheds are prone to increased risks of flooding, mudflows and landslides and are characterised by low agricultural productivity. Implementing EbA interventions such as erosion control measures, agroforestry and sustainable pasture management in these watersheds will restore ecosystem services of flood reduction, soil stabilisation and increased water availability. Concomitantly, these interventions will provide long-term benefits to local communities by: i) providing climate-resilient and ecologically-sound livelihood opportunities; and ii) reducing both the likelihood and impact of climate risks.

EbA interventions for watershed management function optimally as part of an integrated upstream-downstream approach that considers risk avoidance and risk protection. For example, if a watershed is prone to flooding, EbA interventions in the upstream areas can promote ecological processes of flood attenuation and runoff infiltration that reduce downstream flood impacts. Downstream communities can then be further protected by combined grey-green infrastructure such as reinforced river banks that are stabilised with riparian vegetation. Under Component 2, vulnerable watersheds in the KRB will be climate-proofed through the implementation of integrated watershed management with a focus on an EbA approach that provides long-term benefits to local communities.

Outcome 2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.

The integrated catchment management strategy developed under Outcome 1 will inform development across all economic sectors at a catchment scale in the KRB. It will not, however, be sufficiently detailed to inform land-use management practices at a watershed scale. Outcome 2 will consequently include the development and operationalising of Watershed Action Plan (WAPs). These plans will have an overarching focus on addressing climate risks, thereby ensuring full alignment with the catchment management strategy [developed under Output 1.3]. A total of six districts[222] have been identified for EbA implementation, namely Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon. This implementation will serve to demonstrate the cost-effectiveness and adaptation benefits of such EbA interventions.

Under this outcome, an integrated approach for building community resilience to climate change will be established, demonstrated and subsequently implemented. This approach will be informed by detailed WAPs and community enterprise plans that will focus on building the climate resilience of the communities.

There are four outputs to achieve the above-described outcome. These outputs are interlinked through the respective activities by providing support to communities and implementing EbA activities in target regions. The

[222] Refer to the Part I sub-section on the environmental context in Tajikistan for details on these districts.

four outputs and their indicative activities are detailed below, including linkages between the three project outcomes.

Output 2.1. Agro-ecological extension services supported at the *jamoat* level to provide technical support for EbA implementation.

Agro-ecological extension services are currently provided by private enterprises – largely agronomists – at the *jamoat* level on an ad-hoc basis in response to farmer requests. Through a ToT approach, these service providers will be supported to ensure that communities have access to the necessary guidance for effectively implementing EbA.

Indicative activities to be implemented under Output 2.1 are outlined below.

Activity 2.1.1. Support agro-ecological extension services by training existing service providers on EbA, climate-resilient agriculture and multi-hazard climate risk management.

Currently, agro-ecological extension services are being provided to farmers and pastoralists by private enterprises at the *jamoat* level. Under this activity, these existing service providers will be supported to ensure that communities have access to the necessary guidance for effectively implementing EbA. This support will be through a ToT approach that ensures all knowledge sharing is ongoing among *jamoats* and communities. Training will include a focus on EbA, climate-smart agriculture (CSA) and sustainable land management (SLM) to ensure that an integrated approach to management is adopted following the provision of extension services. By providing additional training on multi-hazard climate risk management, existing extension service providers will be informed of the relevant and up-to-date technologies for climate information.

The ToT programme provided to the existing agro-ecological extension service providers will include training on specific processes that are essential to implementing an effective integrated catchment management strategy. These specific processes include measures on EbA, CSA and SLM that all contribute to improved river and water management. The processes are outlined below.

- **Developing land-use plans (LUPs) that take into account all natural resources within and surrounding a particular area**. Efficient land-use planning will prevent social conflicts over land and ensures the sustainable use of available resources. LUP could involve the implementation of rotational grazing and/or cropping as well as intercropping or alternate harvesting. In this way, LUP contributes to increased soil fertility and improved productivity. The ToT programme will train extension service providers on developing land-use plans for specific areas within the target districts. Importantly, this training will differ between regions and within districts because of considerable variability in landscapes.
- **Developing implementation protocols for EbA that are specific to particular soil types, ecosystems and landscape units**. Together with LUP, such implementation protocols will assist with ensuring maximum sustainability of all available resources. Such protocols make use of previous seasons' experiences and outputs to adapt for future seasons. Training to extension services providers will be focused on the process of identifying potential EbA measures to be implemented in a specific region. The training will also include how to determine the appropriate intervention according to the landscape and needs of the community.
- **Training extension service providers on the technical implementation of EbA, including theoretical and practical aspects**. This is because the providers are private enterprises, meaning that farmers may often request guidance rather than hands-on assistance. Extension services consequently need to be able to describe in detail the identified EbA measure as well implement it on the ground.
- **Connecting agricultural producers to markets**. Improving market connectivity among agricultural producers will be a focus in the training of extension service providers. Currently, the existing extension services are not adequately trained or equipped to guide the farmers towards the EBA, including CSA solutions. Neither are the farmers aware of productive benefits of EBA and CSA options or related market opportunities.
- **Introducing agro-processing to extension service providers.** Through agro-processing, there will be added value to primary agricultural products. Training will focus on what the different options are for processing/transformation of raw and intermediate products and how it could benefit the communities in terms of increase in incomes and greater adaptive capacity.

- **Training extension service providers on post-harvest storage handling.** This will promote the use of post-harvest storage facilities among Tajik farmers to reduce crop losses due to climate events and to improve prices received at markets. Training will include the appropriate steps immediately following harvest such as cooling, cleaning, sorting and efficient packing.
- **Training farmers on improving livestock productivity.** With climate change, farmers are likely to become more reliant on their livestock for their livelihoods. By focusing on supporting the health and nutrition of livestock, the resilience of local communities will be improved. Such examples of guidance would be to establish small fodder production units for livestock and to shift from an entirely plant-based diet to a semi-animal-based protein.
- **Developing advisories from climate risk information received from Hydromet**. These advisories will be delivered to farmers to inform their decision-making for the season ahead.

Activity 2.1.2. Establish EbA demonstration plots in each of the target villages.

Under this activity, community demonstration plots will be established in the target villages. These plots will consist of the main EbA interventions to be implemented. The training provided under Activity 1.4.2 will serve as the base for the implementations of these plots. These demonstration plots will be the main platform for: i) demonstrating enhanced crop and livestock productivity; ii) training farmers and pastoralists on the technical details of how to implement EbA interventions; and iii) demonstrating how the interventions reduce climate change-induced soil erosion.

The EbA measures included in the demonstration plots will be selected from the shortlist of EbA interventions to be developed under Activity 2.2.2. Examples of the measures that have been identified as successful and/or potentially successful in the KRB are described in Table 7.

Table 7. EbA measures that have been identified as successful/potentially successful in the KRB. In the 'Applicable area' column, 'N' denotes the northern sub-basin while 'S' denotes the southern sub-basin.

No.	Description	Applicable area
1	Construction of 'protection' gabions along rivers to provide buffers during flash floods.	N,S
2	The introduction of water-saving irrigation techniques such as drip irrigation, dry farming, composting/mulching and making use of cover crops.	N, S
3	Rehabilitation/restoration of degraded forest ecosystems making use of *saxaul* species, as well as others.	N, S
4	Sustainable harvesting for livelihoods from existing 'healthy' forest ecosystems.	N
5	Establishing livestock exclusion zones for the growing of fodder crops such as Lucerne and sainfoin.	N, S
6	Establishing shelterbelts to reduce the deposition of wind-eroded sediment on crops and integrating bio-drainage measures to improve water infiltration.	N, S
7	Introducing indigenous and palatable grass seeds into degraded rangelands.	N, S
8	Introducing rotational grazing of livestock between pastures to assist with increasing field water absorption and decreasing water runoff.	N, S
9	Pasture management such as land-use planning and introducing improved management measures such as exclusion zones and rotational grazing of livestock.	N, S
10	Establishing joint forest management involving communities and local government.	N, S
11	Introducing intercropping and agroforestry, and in specific areas may include apiculture, i.e. beekeeping.	N, S
12	Introducing sustainable long-term community services such as renewable energy and energy-efficient stoves.	N, S
13	Setting up shelterbelts in areas frequently exposed to erosion.	S
14	Establishing commercial plantations making use of an array of indigenous fruit species in degraded lands.	S
15	Introducing organic mulching for farmers to use on croplands which promotes soil fertility as well as water-saving.	S
16	Diversifying crop use, including drought-tolerant and climate-resilient crops.	S
17	Establishing greenhouses for horticulture including local lemon, tomato and cucumber.	S
18	Establishing community woodlots in abandoned areas for fuelwood.	S

No.	Description	Applicable area
19	Providing additional and improving existing extension services provision which will include developing advisories for farmers.	S
20	Establishing on-farm water resource management.	S
21	Rehabilitating existing irrigation, drainage and pumping systems.	S

EbA measures listed in Table 7 above have been identified as priority interventions in the northern and southern sub-basins of the KRB, as indicated. Final selection of activities in each watershed will be through the participatory development of WAPs (Activity 2.2.2). Communities will select the most appropriate interventions for their watersheds through the WAP development process. It is expected that all activities mentioned in Table 7 above will be implemented; however, a right combination of measures will be determined and appropriately customized for each local sub-watershed through local engagement and community participation. The measures will also be scrutinized as part of the project ESMP process.

Project activities where plant introduction/management is an aspect will follow the guidelines outlined below.

- **Expert input.** Experts (ecological, hydrological and agricultural) will be appointed to provide input into the selection and development of protocols for each of the EbA interventions, particularly where plant-introduction/management is an aspect.
- **Site selection.** As part of the participatory mapping process, expert input (ecological, hydrological and agricultural) will inform the selection of sites for EbA interventions. For example, it is envisaged that existing woodlots will be supplemented; newly-planted woodlots will be situated in appropriate, low-risk areas (a safe distance from areas of high conservation value or biodiversity hotspots).
- **Species selection.** Wherever possible, naturally-occurring species will be planted. Where necessary, non-invasive, non-naturally-occurring species will be planted. Known invasive species or species with potentially invasive traits will be avoided. Where alien species will be introduced, the Committee for Environmental Protection (CEP) will be consulted prior to such introduction to ensure that these species do not pose a risk to endemic biodiversity.
- **Operational monitoring and management.** Regular monitoring by the appointed regional/local ecologist/s will be undertaken to ensure early detection and rapid response to any species emerging as potentially invasive. An appropriate invasive species eradication plan will be developed and implemented according to stipulated timeframes.

Activity 2.1.3. Conduct farmer field schools (FFs) in target villages making use of demonstration plots.

The strengthened training programmes under Activity 1.4.2 will inform the development of a curriculum for farmer field schools (FFSs). These FFSs will be conducted in the target villages of Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon Districts and will include training on EbA, CSA and SLM. Specifically, trainings will demonstrate the importance of improved livestock husbandry and community-based rangeland practices. FFSs will be advertised through the activities under Outcome 3. Through the provision of FFSs, local community capacities will be built with specific wide-spread knowledge of EbA, CSA and SLM.

Training of *jamoat*-level extension service providers will be focused on within the FFSs. By including these local experts in the FFSs, the project will promote farmer interaction whereby both government and communities learn from previous experiences. This will allow upstream versus downstream experiences to be shared as well as the development of possible measures that will benefit each other in the future. Through the establishment of demonstration plots [under Activity 2.1.2], training by community members to fellow community members will take place. This will facilitate a training-of-trainers (ToT) approach which further promotes sustainability of project interventions. Community leaders will be selected to take part in the training and sharing of experiences.

Curricula of the FFSs will include training on avoiding soil erosion threats at the community level. This training will be tailored to: i) increase infiltration of rainwater into topsoils; ii) increase the water-retention capacity of soils; and iii) restore soil horizons in landscapes with sheet/gulley erosion. Such management of soils will be underpinned by increasing the vegetative cover of the landscape and the organic matter content of the soil. To

this end, a wide range of land management techniques will be presented for implementation to improve SLM in target villages. Such management interventions and techniques are separated according to the northern and southern sub-basin of the KRB. The specific EbA measures proposed for the northern and southern sub-basins are outlined in Table 7 above.

The proposed techniques outlined above will include EbA practices, which are usually a form of CSA and/or SLM. EbA is currently not being undertaken by local communities because of limited technical capacity to plan, implement and sustainably finance the interventions. Under this activity, this technical capacity will be enhanced at the village level. In addition, Outcome 1 will contribute to building the capacity by strengthening local extension services and village governance structures. FFS will be inclusive, and it is expected that participants will be at least 30% women.

Output 2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target communities.

Under this output, climate risk information will inform the development of fine-scale Watershed Action Plans (WAPs). These WAPs will assist local government and communities in ensuring that all identified EbA measures are carried out in an efficient and effective manner. The WAPs will include detailed budgets that will assist in determining the extent to which EbA measures can be implemented.

WAPs will be developed through a participatory process with communities from target villages in Vahdat, Varzob, Faizobod, Nosiri Khusrav, Shaartuz and Kabodiyon Districts. Such participatory processes will be conducted by holding regular consultation meetings in the villages with local government, PUUs and other relevant organisations. Through this output, the appropriate EbA measures in each watershed will also be shortlisted for future implementation.

Indicative activities to be implemented under Output 2.2 are detailed below.

Activity 2.2.1. Conduct participatory mapping at the watershed level.

All mapping will be conducted in a thorough participatory manner with local communities and community-based organisations (CBOs). These CBOs are likely to include forestry organisations and Pasture User Unions (PUUs). Experts undertaking the mapping will be required to consult with local communities, learning from their on-the-ground experiences in the region. Communities will also be part of the final decision-making process for the shortlisting of EbA interventions [under Activity 2.2.2]. The meetings will be to consult with communities on their knowledge of watershed mapping, as well as to inform, update and make decisions for the future planning.

PUUs are currently in place in certain regions of the country. These PUUs have been established through previous and ongoing projects. Further development of existing associations, as well as the establishment of new PUUs, will be supported under this activity by conducting participatory mapping of each target watershed in the KRB. The mapping will make use of ecological, hydrological and agricultural data as well as regional and local experts to determine the most appropriate EbA measures to be implemented at the watershed level to improve community resilience.

These ecological, hydrological and agricultural experts will also assist with determining the most appropriate land-use management changes necessary to address the climate change threats in the villages' surrounding landscapes. The recommendations will take into account the integrated catchment approach of the project, based on the strategy developed under Output 1.3.

Activity 2.2.2. Develop Watershed Action Plans (WAPs) for vulnerable watersheds in the Kofirnighan River Basin.

Results of the participatory mapping conducted at the watershed level [Activity 2.2.1] will inform the selection of a wide range of EbA measures for each targeted watershed. These interventions will be assessed to form a shortlist that will be used for implementation recommendations going forward.

The land-use plans informed by these recommendations will be treated as working documents, primarily because of the: i) participatory nature of the mapping; ii) selection of shortlisted EbA interventions; and iii) monitoring to be conducted of implementation interventions. These working documents are flexible in nature in that they can be changed in an iterative manner as more relevant and up-to-date information becomes available. Importantly, these WAPs will be carefully aligned with the integrated catchment management strategy developed under Outcome 1 [under Output 1.3]. WAP development will be facilitated by district representatives from CEP and *jamoat*-level government in a participatory process with local communities living in the watersheds.

These WAPs will outline what types of EbA interventions will be implemented in which areas, propose sustainable rates of extraction for local ecosystems, and identify the types of protection measures that need to be undertaken. This will ensure that the plans will be responsive to local needs, while also building local community ownership of WAPs. Through the participatory development of WAPs, local community members will gain an increased understanding of climate risks, DRR and the importance of sustainably managing watersheds.

Output 2.3. EbA interventions implemented in target watersheds by local communities.

Under Output 2.3, local communities will be supported in implementing EbA interventions identified in Output 2.2. These interventions will reduce climate risks in two ways. Firstly, interventions such as reforestation, agroforestry and sustainable pasture management in degraded watersheds will strengthen the provision of ecosystem services. These ecosystem services include increased groundwater recharge and soil stabilisation, which will reduce the downstream impacts of flooding, landslides, soil erosion and limited water availability. Secondly, project activities will include protection interventions downstream. These interventions will include river bank stabilisation and flood protection.

The sustainability of watershed rehabilitation activities will be ensured by promoting local community livelihoods that are decoupled from unsustainable natural resource extraction. This will be done by using economically valuable species such as fruit and nut trees for watershed reforestation wherever possible. Reforestation activities will also be guided by existing Forest Development Plans. In addition, the environmental sustainability of local community livelihoods will be increased through the implementation of sustainable livelihood alternatives. Such alternatives will include low energy cookstoves, as well as harvesting fuelwood and timber species from local community woodlots.

The implementation of sustainable livelihoods will increase the environmental sustainability of local communities by providing these communities with sources of supplemental income that is decoupled from environmental degradation. For example, community woodlots will provide local communities with access to fuelwood and timber from suitable fast-growing species that will reduce their reliance on sourcing fuelwood from nearby forests. Woodlots will also be situated nearby beneficiary communities to reduce the labour burden of collecting fuelwood. Improved management practices from agricultural and pasture lands will reduce environmental degradation from overgrazing and soil degradation while also increasing local biodiversity.

Activity 2.3.1. Support local communities to implement priority EbA interventions.

Under this activity, local community members in ~100 villages across 14 *jamoats* in the six target districts will be supported in implementing the priority EbA interventions demonstrated in Output 2.2. Community member support will be gender inclusive and it is intended that at least 40% of recipients will be women. Communities will be provided with technical assistance and inputs for implementing risk-reduction activities such as watershed reforestation, erosion control measures and flood reduction measures. Additionally, inputs will be provided for measures that increase energy efficiency and consequently reduce unsustainable practices (such as low-energy cook stoves).

Nurseries will be established in each of the 14 *jamoats* to provide local community members with suitable climate-resilient species for watershed reforestation, agroforestry and intercropping. Economically useful species such as fruit trees or high-value timber trees for woodlots will be prioritised and species selection will be informed by local conditions as well as community needs.

Selection of the EbA interventions will be informed by an assessment of their social, environmental and economic impacts within a community. Local communities will be consulted to agree on which EbA interventions should be implemented in the different land categories. The proposed EbA interventions that will be assessed for selection on the shortlist have been listed under Output 2.1 [specifically under Activity 2.1.3] and a more detailed list is provided in Annex 9. This list also includes details on the expected cost-effectiveness of each intervention. While it is expected that all activities that have been listed will be implemented, each local community will have the opportunity to provide input into the selection of locally-appropriate activities. Consequently, some activities may not be implemented as a result of local preferences. Additional community consultations will be undertaken during the insipient phase, in the first year of project implementation to allow communities to provide their inputs into the final verification of these interventions. The consultations will be inclusive and conducted using locally-appropriate methods for community engagement.

Activity 2.3.2. Support local community members in developing Enterprise Plans (EPs) based on EbA interventions.

Under this activity, local communities will be supported in developing EPs. The activity will encourage women involvement, with at least 40% of participants being women. Local community members will receive training on enterprise development and be educated on the economic viability of ecologically-sound natural resource-based businesses. By demonstrating the economic viability of EbA interventions for watershed restoration to local communities, this activity will contribute towards the sustainability and scalability of project interventions.

Local community members will be trained on how to start and maintain enterprises based on EbA interventions. Training will include cash flow prediction, product processing and accessing suitable markets.

Activity 2.3.3. Monitor the impacts of EbA interventions.

Continuous monitoring will be done at the community-level to provide an evidence-base on the effectiveness of EbA interventions and to enable adaptive management to take place. Community monitoring plans will be developed to enable continuous monitoring of WAPs [developed in Activity 2.2.2]. Local community members will monitor the impacts of EbA interventions and other actions implemented under WAPs. Authority figures in the local communities will be trained on interpreting monitoring information and taking adaptive management decisions based on the available information. Women will be encouraged to participate in these aspects of monitoring and adaptive management decision-making. Existing local-level gender dynamics will be taken into account to ensure that involvement in these activities does not place an additional labour burden on women and men. In addition, monitoring information will be shared with *jamoat*-level government officials and extension service providers, who will use this information to inform their decision-making at *jamoat* level.

Monitoring is likely to include the extent of damages from climate-related disasters, such as floods and landslides. In addition, the reliance of local community members on unsustainable practices will also be monitored. Indicators will be identified in community monitoring plans but are likely to include the amount of fuelwood harvested from natural forests.

Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the Kofirnighan River Basin.

The activities of the proposed project have significant upscaling potential throughout Tajikistan and in Central Asia. Other countries in the region face similar climate change risks and are likely to benefit from adopting an integrated catchment management approach using EbA. Consequently, lessons learned from this project will provide an evidence-base to both inform and promote project activities beyond the project's geographical scope. To ensure that lessons learned are adequately collected, collated and disseminated, this component will focus on strengthening knowledge management around integrated catchment management and EbA in Tajikistan.

Outcome 3. Existing knowledge management platforms supported for integrated catchment management and EbA.

A number of projects to address climate change impacts have been implemented at a village level across Tajikistan in the past decade. Many of these projects have had considerable success in terms of reducing soil erosion, raising finance for EbA interventions and increasing crop and livestock productivity. Consequently, numerous lessons have been learned for climate change adaptation activities in the country. These lessons include:

- establishing governance structures, from a national to village scale, to support EbA interventions;
- methods for engaging local communities;
- mechanisms for sharing lessons and best practices between villages;
- methods to undertake applied research in a participatory community approach;
- use of technology, such as smartphone applications, for training on and monitoring of interventions; and
- incentives[223] required to ensure long-term implementation and maintenance of EbA interventions by local communities.

The lessons listed above have, to date, not been collated, analysed and shared. They remain dissipated across projects and are consequently often viewed as unreliable because their underlying data is not available for public viewing. Under this outcome, activities will support existing knowledge management platforms and hubs to facilitate the exchange of lessons learned across Tajikistan. By providing much-needed support to these platforms, information will be readily accessible and available for dissemination to different organisation levels, including national government ministries to the villages. This method will ensure that local knowledge sharing continues beyond the project lifespan and also raises awareness of the benefits of EbA for integrated catchment management in the country. The evidence base assembled under this outcome will ultimately be used by policy-makers for informing the revision of legislation, policies and strategies relevant to upscaling EbA across Tajikistan.

There are three outputs to achieve the above-described outcome. These outputs are interlinked through the respective activities to ensure the necessary support is provided to knowledge sharing platforms to facilitate information transfer. The three outputs and their indicative activities are detailed below, highlighting the linkages between the three project outcomes.

Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.

Currently, several knowledge management platforms and hubs exist within Tajikistan as a result of previous and ongoing development projects. Because of this, a network already exists for the housing, viewing and transfer of new information. Such institutions include the University of Central Asia (UCA) and the Open Centre under the Department of Geology (DoG). These institutions are mandated with the responsibility of collating, analysing and disseminating information on climate risks and suitable adaptation options. By providing support through gender-disaggregated training and information transfer, this output will promote the sustainability of these platforms.

Indicative activities to be implemented under Output 3.1 are outlined below.

Activity 3.1.1. Support existing knowledge management platforms responsible for collating, analysing and disseminating information on climate risks and suitable adaptation options.

The existing knowledge management platform that has been identified for facilitation and support through Output 3.1 is the Open Centre under the DoG. As a reputable academic institution, the UCA will also be supported considering its goal and mandate to expand to rural regions of Tajikistan and other Central Asian countries. Through supporting these two institutions, awareness raising activities will be promoted on climate risks and the benefits of integrating EbA into landscape management.

In order to effectively provide support to the platforms, all new information to be provided will be screened to ensure it is scientifically sound. An emphasis will be placed on information underpinned by credible scientific analysis methods. Anecdotal information will be also be made available with, however, the caveat that further research is needed to determine its accuracy.

[223] e.g. financial, environment, cultural and aesthetic

Activity 3.1.2. Collect and collate data and information from automated weather stations, agro-ecological extension centres and international publications..

Further to the data generated by automated weather stations (Outcome 1), additional data and information from *inter alia* local extension centres and from international publications will be collected and collated. This collated data and information will be made available to the supported information centres and participating local community members. While the Open Centre will provide a repository of information, to be disseminated to local communities, national decision-makers and academics, UCA will facilitate active sharing and training of the information (Activity 3.1.1.).

Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.

To increase the quality of information available on the platform(s), Output 3.2 will include the development of an impact evaluation framework. This framework will be used for assessing EbA interventions implemented through the project, the sites selected for EP implementation, and also those villages that have had or are adjacent to areas where prior EbA interventions have been successful. Given that EbA benefits materialise fully over decades, the framework will need to be used by stakeholders during as well as after the completion of the project. A long-term research approach will consequently underpin the design of the framework.

Indicative activities to be implemented under Output 3.2 are detailed below.

Activity 3.2.1. Establish an impact evaluation framework to enable the effective quantification of project benefits and to provide information for future planning and implementation of EbA interventions.

An impact evaluation framework will be developed to monitor the impacts of project interventions. This framework will include the use of semi-randomised trials in areas with and without project interventions. In so doing, the framework will enable the effective attribution and quantification of project benefits and provide information for the future planning and implementation of EbA interventions across the country.

Activity 3.2.2. Obtain data and information through applying the framework will be disseminated via the knowledge platform(s).

The data and information obtained through applying the framework will be disseminated via the communication channels of the supported knowledge platform(s).

B. Economic, social and environmental benefits

Climate variability is already reducing agricultural productivity which is directly impacting food security in Tajikistan. This situation is likely to be exacerbated by predicted climate change-induced increases in extreme climate events. These events include floods, landslides and drought. The design of the proposed project is intended to provide adaptation alternatives for vulnerable Tajik communities to improve their resilience to climate change.

Activities and outputs of the project will have several economic, social and environmental benefits which will contribute to furthering sustainable development within Tajikistan. Activities have been designed to address the barriers identified as hindering climate change adaptation (CCA) in the country, namely: i) limited capacity of institutions to include CCA into national plans; ii) limited technical capacity of public services to implement activities among communities for CCA; and iii) limited knowledge sharing on CCA in Tajikistan.

The primary, overarching benefit of the project will be a reduction in climate risks. In doing so, environmental, social and economic damages as a result of climate change will be minimised among rural Tajik communities. This benefit will be realised by: i) reducing the exposure of vulnerable communities in the KRB to climate hazards; and ii) increasing the resilience of KRB communities and ecosystems to the impacts of climate hazards. To

optimise sustainable development co-benefits, project interventions aimed at building climate resilience will use an EbA approach.

Implementing EbA in agricultural systems[224,225] has been proven to improve the ability of crops and livestock to adapt to climate change and variability. These practices can be implemented at various scales to improve land-use management. For example, on-farm management of genetic biodiversity can ensure a broader source of crop resistance-capacity to uncertain occurrences and effects of extreme climate events. Genetic biodiversity is promoted through the diversification of crop varieties or inclusion of wild relatives. Other farm-level practices include the use of: i) integrated pest management strategies; ii) new cropping systems to reduce the impacts of pests and diseases; iii) the planting of windbreaks; and iv) the planting of agroforestry systems or cover crops to help reduce the evapotranspiration effect. At the landscape level, EbA helps regulate water and nutrient cycling by ensuring tree cover or natural vegetation in areas of hydrological importance. EbA also reduces the incidence or severity of crop pest and disease outbreaks related to extreme climate events. This is because enhancing the structural complexity of the agricultural landscapes through diverse cropping systems or inclusion of natural vegetation and on-farm tree cover promotes pest regulation.

EbA practices benefit smallholders in multiple ways beyond helping them adapt to climate change. For example, they help ensure the continued provision of ecosystem services on which farming depends such as water provision, food provision, nutrient regulation, pest control and pollination. This contrasts with other non-EbA adaptation measures, such as excessive use of agro-chemicals. Such adaptation measures can yield adaptation benefits but may negatively impact the provision of ecosystem services, whilst having additional negative environmental off-site effects including the loss of biodiversity or contamination of streams. In addition, the use of EbA practices can help diversify production systems and sources of income generation, providing more stability to smallholder farmers. For example, the use of intercropping and agroforestry in production systems can diversify farmer revenue. This revenue is generated by providing timber, fruits, fuelwood and building materials that farmers can use for additional income, especially in years when income from the main cash crop is reduced. These additional products reduce farmer vulnerability to market changes as well as their dependence on outside products which improves farmer food security both directly and indirectly. The use of agroforestry practices can also make significant contributions to biodiversity conservation efforts. In addition, many EbA practices can help mitigate climate change by either reducing the amount of GHGs emitted from agricultural systems[226], or by increasing the overall farm biomass[227].

Environmental, social and economic benefits of the proposed project that will accrue to rural Tajik citizens are listed in Table 8. Brief description of each set of benefits follow.

Environmental benefits

EbA interventions increase the functionality of ecosystems and strengthen the provision of ecosystem goods and services. Environmental benefits that will be generated during the project are listed in Table 8 below and it is expected that these benefits will be generated during the proposed project and will remain beyond the project lifetime. This is because ecosystems, once established, tend to require less maintenance than hard infrastructure. In particular, it is expected that, as project practices are upscaled and replicated in the future, environmental benefits will be spread throughout the KRB.

Social benefits

[224] Ecosystem-based Adaptation (EbA) is defined as in agricultural systems as the implementation of agricultural management practices that use or take advantage of biodiversity, ecosystem services or ecological processes (either at the plot, farm or landscape level) to help increase the ability of crops or livestock to adapt to climate variability. In contrast, practices that substitute the role of biodiversity in providing ecosystem functions and services for agricultural production such as excessive use of inorganic fertilizers or pesticides is not ecosystem-based.

[225] Vignola R, Harvey CA, Bautista-Solis P, Avelino J, Rapidel B, Donatti C & Martinez R. 2015. Ecosystem-based adaptation for smallholder farmers: Definitions, opportunities and constraints. Agriculture, Ecosystems and Environment 211:126–132.

[226] e.g. by reducing the use of inorganic fertilisers, agrochemicals, machinery and associated emissions

[227] e.g. by increasing soil carbon stocks or above-ground biomass

A number of social benefits are detailed in Table 8 below. These benefits will accrue to rural Tajik citizens during and after project implementation. The main social benefits will be achieved through a reduction in the exposure of rural Tajik citizens to increasing climate risks through the restoration of vulnerable watersheds. Additionally, project activities are expected to particularly benefit women. Many of the activities of the project will generate benefits that will accrue to women, in particular. For instance, the sustainable harvesting of fuelwood from conveniently located woodlots is expected to reduce the time allocation of women for collecting fuel. Combined with energy-efficient cookstoves, this activity will largely improve the lives of rural Tajik women by reducing their labour. Other activities that generate supplemental incomes, such as apiculture, will be targeted specifically at women. In addition to promoting women-led small enterprises, the AF project will specifically target women for educational activities on climate change adaptation.

Economic Benefits

The project will generate two types of economic benefits: i) reduced losses from the impacts of climate change; and ii) gains in marginal utility as a result of project interventions. Marginal utility gains are expected as a result of the introduction of practices that: i) generate or increase income; and ii) reduce the labour burden of vulnerable communities. Project activities will provide opportunities for rural Tajik citizens to generate or increase income from agricultural activities, as shown in Table 8 below. However, some project interventions (such as the introduction of cookstoves or the planting of woodlots) are also predicted to reduce the labour burden of local community members.

Most of the economic benefits are expected to persist beyond the project lifetime. However, any employment of local community members in project activities is expected to cease after project closure. Where vulnerable community members are employed in project activities, these community members will be trained to ensure that they will be capable of establishing and maintaining natural resource-based enterprises. This will provide community members with a sustainable source of income beyond the project lifetime.

Table 8 illustrates the social, economic and environmental benefits associated with the EbA interventions to be implemented through the proposed project.

Table 8. Specific expected social, economic and environmental impacts and benefits per outcome of the proposed project under two scenarios: a) without the project (baseline); and b) with the project (additionality).

Outcome	**a) Without the project (baseline)**		
	Environmental impacts	**Social impacts**	**Economic impacts**
1. Catchment management strategy to manage climate risks operationalised at Raion (district) and jamoat (sub-district) levels in Kofirnighan River Basin (KRB).	• Continued climate-change induced degradation of the KRB catchment	• No beneficial changes in awareness, technical capacity or gender equality	• Increased economic losses expected as a result of climate-change induced catchment degradation and the loss of ecosystem goods and services
2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	**Failure to construct gabions** • Existing environmental problems exacerbated by climate change impacts	• Reduced production area, land productivity and crop yield	• Increased economic losses as a result of increasing agricultural inputs and production costs
	Failure to implement stone lines and contour bunds • Existing environmental problems exacerbated by climate change impacts (increased runoff, soil loss, downstream siltation, downstream flooding and reduced water infiltration, soil moisture, soil organic matter, above-ground biomass)	• Reduced production area, land productivity and crop yield	• Increased economic losses as a result of increasing agricultural inputs and production costs

Outcome	a) Without the project (baseline)		
	Environmental impacts	**Social impacts**	**Economic impacts**
	Failure to implement water-saving irrigation techniques • Existing environmental problems exacerbated by climate change impacts	• Increased water consumption and decline in crop yield	• Increased economic losses as a result of drought-related crop losses, increased agricultural inputs and production costs
	Failure to diversify crops and use drought-resilient crops • Limited biodiversity conservation (of genetic resources) • Crops poorly-adapted to climate change conditions **Horticulture in greenhouses** • Decreased intensity of cultivation through un-consolidated production area under the BAU scenario	• Limited diversity of production within farms • Reduced nutrition for local community, negatively affecting community health and increasing the burden on women who are traditionally the primary care-givers within rural households • Reduced crop yield • Increased crop susceptibility to pests	• Increased economic losses as a result of climate change-related crop losses
	Failure to establish intercropping, agroforestry and woodlots • Increased pressure on natural forests • Crops and livestock exposed to extreme climate conditions • Existing environmental problems exacerbated by climate change impacts	• Limited diversity of production on and off-farm, reducing the opportunities to promote the involvement of rural women e.g. apiculture • Reduced provision of food and fodder, increasing the labour burden on rural women in particular who are traditionally responsible for the collection of fuelwood. Reduced nutrition for local community, negatively affecting community.	• Increased economic losses as a result of climate change-related crop losses • Reduced capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the increased labour burden
	Failure to rehabilitate/restore degraded forest ecosystems • Increased biodiversity loss • Crops and livestock exposed to extreme climate conditions • Existing environmental problems exacerbated by climate change impacts	• Decreased nonmaterial benefits (e.g. scenic resources, recreation, science and education, spiritual and religious) derived from loss of conservation value of landscape	• Increased loss of trees to drought or dry spells • Reduced ecosystem services such as tourism (e.g. hiking) and recreation
	Failure to implement sustainable harvesting from 'healthy' forest ecosystems • Crops and livestock exposed to extreme climate conditions • Increased biodiversity loss • Existing environmental problems exacerbated by climate change impacts	• Reduced provision of food and fodder • Reduced nutrition for local community, negatively affecting community health and increasing the burden on women	• Increased economic losses
	Failure to establish and maintain livestock exclusion zones • Decreased above-ground biomass • Increased biodiversity loss	• Decreased nonmaterial benefits derived from loss of conservation value of landscape	• Decreased ecosystem services such as tourism (e.g. trekking) and recreation

Outcome	a) Without the project (baseline)		
	Environmental impacts	**Social impacts**	**Economic impacts**
	• Existing environmental problems exacerbated by climate change impacts		
	Failure to sow palatable and indigenous grass seeds in degraded rangelands and introduce rotational grazing • Decreased above-ground biomass • Decreased biodiversity conservation • Existing environmental problems exacerbated by climate change impacts	• Reduced pasture productivity and carrying capacity	• Decreased farm income through decreased carrying capacity
	Failure to convert to energy efficient technologies and practices • Unsustainable practices would persist e.g. using unsustainably harvested fuelwood for cooking using open fires	• Increased labour burden on rural women who would need to cover increasingly large distances to harvest fuelwood for cooking	• Reduced capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the increased labour burden
3. Existing knowledge management platforms supported for integrated catchment management and EbA.	• Insufficient information on EbA would be available to local communities, resulting in little/no implementation of EbA and the persistence extreme vulnerability to climate change • Local communities would likely fail to engage in developing and implementing adaptation approaches to local problems i.e. low soil fertility resulting from soil erosion.	• Failing to adopt adaptation technologies would increasingly expose community livelihoods to the worsening impacts of climate change • Current limited levels of knowledge of climate change adaptation would persist	• Microfinance for community-led small-scale projects focusing on community-based adaptation would likely remain inaccessible

Outcome	b) With the project (additionality)		
	Environmental benefits	**Social benefits**	**Economic benefits**
1. Catchment management strategy to manage climate risks operationalised at Raion (district) and jamoat (sub-district) levels in Kofirnighan River Basin (KRB).	• Enhanced catchment integrity through better protection	• Increased awareness and technical capacity of policymakers and government institutions regarding climate-resilient adaptation technologies • Increased capacity of professionals to present climate change adaptation information • Increased gender equality at a local and national level – 30% of participants involved will be women	• Increased profit margins will be realised in the long-term as a result of training provided on climate change adaptation technologies and integrated catchment management
2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	**Construction of gabions** • Reduced slope instability and risk of minor mudslides and landslides • Slowed water runoff, increased water infiltration and soil moisture • Reduced soil loss (particularly through reduced gully erosion) • Increased soil organic matter • Increased above-ground biomass	• Increased production area • Increased land productivity and crop yield	• Increased farm income • Reduced loss of crops and land caused by slope instability

Outcome	b) With the project (additionality)		
	Environmental benefits	**Social benefits**	**Economic benefits**

	• Off-site benefits:
	  ○ reduced downstream siltation
	  ○ reduced downstream flooding
	  ○ increased groundwater and river water quality		

	Stone lines and contour bunds • Slowed water runoff, increased water infiltration and soil moisture • Reduced soil loss (particularly through reduced sheet erosion) • Increased soil organic matter • Increased above-ground biomass • Off-site benefits	• Increased production area • Increased land productivity and crop yield	• Reduced agricultural inputs and thus production costs • Increased farm income
	Water-saving irrigation techniques • Reduced evaporation of soil moisture • Increased water infiltration and soil moisture • Delivered constant moisture to root zone (reduced drought-stress) • Reduced soil loss (particularly through reduced rain-splash erosion caused by overhead irrigation) • Increased above-ground biomass of crops, reduces above-ground biomass of weeds • Reduced plant pathogens e.g. fungus	• Reduced water consumption • Increased crop yield	• Reduced agricultural inputs and thus production costs • Increased farm income • Reduced loss of crops to drought or dry spells
	Diversification of crops and use of drought-resilient crops • Increased biodiversity conservation (of genetic resources) **Horticulture in greenhouses** • Increases intensity of cultivation through consolidation of production area	• Increased diversity of production within farms • Increased nutrition for local community, improving community health • Increased crop yield • Reduced crop susceptibility to pests	• Increased farm income • Reduced risk of economic failure due to diversification of production
	Intercropping, agroforestry and woodlots • Reduced pressure on natural forests • Protected crops and livestock from extreme climatic conditions • Increased biodiversity conservation • Reduced slope instability and risk of minor mudslides and landslides • Slowed water runoff • Increased soil moisture • Reduced soil loss (through reduced sheet and gully erosion) • Increased soil organic matter • Increased above-ground biomass • Increased climate regulation and carbon sequestration • Off-site benefits:	• Increased diversity of production on and off-farm, with increased opportunities to promote the involvement of rural women e.g. apiculture • Increased provision of food and fodder. • Increased nutrition for the local community, improving community health • Increased provision of fuelwood and timber, reducing the burden on rural women in particular who are traditionally responsible for the collection of fuelwood	• Increased farm income • Reduced risk of economic failure in response to diversification of production • Increased capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the reduced labour burden
	Rehabilitation/restoration of degraded forest ecosystems • Increased biodiversity conservation • Increased water infiltration	• Increased nonmaterial benefits (e.g. scenic resources, recreation, science and education, spiritual and religious) derived from	• Reduced inputs and thus production costs • Increased farm income • Reduced loss of trees to drought or dry spells

Outcome	b) With the project (additionality)		
	Environmental benefits	**Social benefits**	**Economic benefits**
	• Increased above-ground biomass (increased plant survival) • Protected crops and livestock from extreme climatic conditions • Reduced slope instability and risk of minor mudslides and landslides • Slowed water runoff • Increased soil moisture • Reduced soil loss (through reduced sheet and gully erosion) • Increased soil organic matter • Increased climate regulation and carbon sequestration • Off-site benefits	increased conservation value of landscape	• Increased ecosystem services such as tourism (e.g. hiking) and recreation
	Sustainable harvesting from 'healthy' forest ecosystems • Protected crops and livestock from extreme climatic conditions • Increased biodiversity conservation • Reduced slope instability and risk of minor mudslides and landslides • Increased soil moisture • Reduced soil loss • Increased soil organic matter • Increased above-ground biomass • Increased climate regulation and carbon sequestration • Off-site benefits	• Increased provision of food and fodder • Increased nutrition for the local community, improving community health and reducing the burden on women who are traditionally the primary care-givers within rural households	• Increased farm income • Increased capacity of rural women in particular to pursue and maintain alternative livelihoods as a result of the reduced labour and care-giver burden
	Livestock exclusion zones • Increased above-ground biomass • Increased biodiversity conservation • Slowed water runoff • Increased soil moisture • Reduced soil loss (particularly through reduced sheet erosion) • Increased soil organic matter • Increased climate regulation and carbon sequestration • Off-site benefits	• Increased nonmaterial benefits (e.g. scenic resources, recreation, science and education, spiritual and religious) derived from increased conservation value of landscape	• Increased ecosystem services such as tourism (e.g. trekking) and recreation
	Sowing of palatable and indigenous grass seeds in degraded rangelands and introducing rotational grazing • Increased above-ground biomass • Increased biodiversity conservation • Slowed water runoff • Increased soil moisture • Reduced soil loss • Increased soil organic matter • Increased climate regulation and carbon sequestration • Off-site benefits	• Increased pasture productivity and carrying capacity	• Increased income from livestock
	Conversion to energy efficient technologies and practices • Increased energy-efficiency of practices e.g. using low-energy cookstove • Reduced pressure on forests	• Reduced labour burden on rural women as a result of improved fuel efficiency	• Increased capacity of rural women in particular to pursue and maintain alternative livelihoods

Outcome	b) With the project (additionality)		
	Environmental benefits	**Social benefits**	**Economic benefits**
			as a result of the reduced labour burden
3. Existing knowledge management platforms supported for integrated catchment management and EbA.	• Involving communities in developing the approaches allows more flexible adaptation efforts, i.e. catering specifically for reduced soil nutrients through soil erosion etc.	• Improved livelihoods through adoption of climate-resilient adaptation technologies and innovative climate information technologies within and surrounding vulnerable communities • Increased knowledge through training provided to relevant local-level government and NGO officials • Increased community-uplift in response to developing their own project proposals for on-the-ground implementation within their communities	

C. Cost-effectiveness

Alternatives to the baseline context in Tajikistan include the null alternative, the traditional alternative and the proposed alternative. These three scenarios are presented below.

Scenario 1. 'Do nothing' approach
The first scenario assumes that no interventions will be implemented. This means that the baseline scenario will remain, and the negative impacts of climate change will continue to cause significant losses to the economy. Climate change impacts such as rising temperatures and increases in intense rainfall events will be exacerbated by business-as-usual practices. Rural Tajik communities will continue to lack the required technical capacity to climate-proof their livelihoods and will continue to be impacted disproportionately by the negative impacts of climate change. Predicted declines in the agricultural yield under climate change conditions will further reduce the food security in the country, while an increasing number of climate change migrants will be exposed to hydrometeorological risks.

Scenario 2. Use of a non-EbA approach
Traditional approaches to managing the impacts of climate change may include engineered structures that protect infrastructure, agricultural fields and communities from floods and landslides. Such approaches may also result in an increase of agricultural inputs to offset a loss in soil productivity. These types of approaches are likely to yield adaptation benefits to local communities but have a number of undesirable shortfalls. Firstly, traditional approaches generally do not generate significant co-benefits. These approaches are inflexible in that each intervention generally only serves one purpose. Secondly, traditional approaches are frequently technology-oriented and require technical capacity to implement and maintain. This capacity is often lacking among local communities in Tajikistan. As a result, hard infrastructure such as flood protection dams are frequently not sustainable in the long term. Lastly, traditional approaches are frequently costly, with significant associated capital and operational costs. Neither the GoT or local communities currently have the financial capacity to construct and maintain technological solutions – particularly as maintenance costs are likely to increase with the increasing impacts of climate change.

Scenario 3. Integrated catchment management, including EbA solutions
Under this scenario, the target communities in Tajikistan will be introduced to EbA practices that include CSA and SLM interventions. Community members will be trained on how to adopt these EbA solutions to manage the landscape through an integrated cross-cutting strategy rather than by each sector. This integrated catchment management strategy will be focused on increasing the resilience of small-scale farmers and pastoralists in Tajikistan to the impacts of climate change. Such EbA interventions are inherently multi-use, providing several social, economic and environmental co-benefits. EbA interventions are also frequently cheaper and easier to

maintain than their traditional counterparts. As a result, community members are more likely to continue maintaining EbA interventions in the long term.

Table 9. Qualitative indicators for the economic, environmental and social cost-effectiveness of the 3 scenarios

Indicator	Scenario 1	Scenario 2	Scenario 3
Economic	• Expected increase in losses as a result of climate change	• Climate change losses are avoided/reduced • High operations/ maintenance costs	• Climate change losses are avoided/reduced • Low operations/ maintenance costs • Economic benefits realised through increased agricultural production and alternative livelihood opportunities
Environmental	• Increasing ecosystem degradation as a result of increased erosion, flooding and landslides • Increasing reliance of local communities on unsustainable extraction of environmental goods such as fuelwood	• Increasing ecosystem degradation as a result of: i)increased fertiliser use; ii) implementation of hard infrastructure; and iii) climate change impacts	• Ecosystems are rehabilitated and maintained • Communities are provided with livelihood opportunities that are decoupled from ecosystem degradation
Social	• Loss in economic opportunities • Impacts on particularly vulnerable groups – e.g. women	• Possible loss of private land for construction and resettlement resulting in negative social consequences	• Increase in economic opportunities • Gender-responsive approach improves the livelihoods of rural Tajik women

Preferred solution

The preferred solution for the proposed project is Scenario 3, which encompasses an integrated approach to catchment management for vulnerable Tajik communities. Although Scenario 2 is a technically viable alternative, the preferred solution has been chosen because: i) EbA is likely to be cost-effective; and ii) EbA interventions are likely to be more sustainable than a traditional approach. The overall objective of the proposed project is cost-effective in that a proactive approach to climate-risk management will be promoted throughout Tajikistan. Climate impacts are predicted to cost the country more than US$132 million annually by 2050. Preventative measures, such as climate-informed planning and development, will avoid some of these costs. Such a preventative approach to climate risks is more cost-effective than reactionary measures.

Project outputs will focus on improving catchment management, including landscape management and planning processes, in rural areas of Tajikistan. In so doing, the project will create an enabling environment for climate change adaptation to occur in vulnerable catchments. These processes are inherently replicable across the country, thereby strengthening the sustainability, reach and impact of the project objectives. The strengthened knowledge management provided through Outcome 3 will further promote adaptive management of EbA and climate risk management in Tajikistan. This will ensure that future activities in the country benefit from a strengthened local knowledge base for EbA and catchment management. Overall, the project will benefit at least 46,000 people living in ~100 villages in the 6 most vulnerable districts throughout the KRB. This represents ~5% of the total KRB population. This number is considered a conservative estimate, as many project activities are predicted to generate benefits for communities living downstream of project intervention sites. These communities could not be identified during the project development phase. In addition, improved catchment management practices are expected to indirectly benefit: i) the entire population of the 6 most vulnerable districts in the KRB (~828,000); and ii) the entire population of the KRB (~2.8 million).

At a local level, the project will promote the use of EbA interventions, which have been demonstrated to have favourable cost-benefit ratios while providing significant sustainable development co-benefits[228,229]. For example, soil conservation measures have been shown to increase crop productivity by between 15–25%[230]. Project activities will support EbA interventions in target districts and sites[231], providing improved livelihoods and value addition for agricultural and pastoral products. This has been shown to be more cost-effective for increasing income and reducing poverty than support for other sectors[232]. Introducing agrobiodiversity and ecosystem service improvement practices to smallholder farmers ensures that farm-based livelihoods will be resilient to climate change and variability[233]. During the project development phase, a cost-effectiveness analysis of proposed EbA activities was completed for both the northern and southern sub-basins of the KRB was conducted. All the proposed activities are associated with a positive Internal Rate of Return (from 10% to 50%). Benefit-to-cost ratios range from 3:1 to 12:1, and payback periods from 2 years to 8 years. The results of the analysis are displayed in Annex 9.

The cost-effectiveness of the project's on-the-ground adaptation interventions [under Outcome 2] will be greatly enhanced by the EbA approach. A growing scientific literature library highlights that EbA measures result in a greater ratio of cost-benefit compared to the implementation of hard infrastructure. For example, an economic analysis of the restoration and rehabilitation of degraded woodlands[234] estimates internal rates of return of 20–60% and cost-benefit ratios of up to 35:1 for grasslands[235]. An example of the cost-effectiveness of EbA approaches also recently emerged from an economic analysis undertaken in Lami, Fiji[236]. This analysis included assessments of the costs and benefits of three approaches to watershed management, namely: i) EbA measures only; ii) hard infrastructure interventions only; and iii) a hybrid approach applying both EbA measures and hard infrastructure interventions. Results of the analysis demonstrated that EbA options for watershed management are at least twice as cost-effective as hard infrastructure engineering options – i.e. a cost-benefit ratio of US$19.50:1 for EbA compared to US$9:1 for hard infrastructure. The cost-effectiveness of EbA approaches is expected to benefit the project through the implementation of EbA activities in target project sites.

D. Consistency with national priorities

As a country, Tajikistan only recently started modifying their national policies and institutional frameworks to integrate the need for adaptation. Although the country has a relatively strong legislative framework regarding environmental protection, very few strategies or policies developed prior to 2010 acknowledge climate change as a cross-sector threat.

While climate change has not previously been acknowledged as a discrete threat, the importance of agriculture and water resources to the economy and to the country as a whole has been recognised. There are, therefore, numerous older policies, strategies and programmes that are synergistic with the outcomes of the project. The most significant of these is the 2003 National Action Plan for Climate Change Mitigation (NAPCC)[237,238]. This is the only strategic framework specifically addressing the implications of climate change and is also strongly aligned

[228] Jones HP, Hole DG & Zavaleta ES. 2012. Harnessing nature to help people adapt to climate change. Nature Climate Change 2:504–509.
[229] UNEP/STREP. 2012. A comparative analysis of ecosystem-based adaptation and engineering options for Lami Town, Fiji: Synthesis Report.
[230] Tesfaye A, Brouwer R, van der Zaag P & Negatu W. 2016. Assessing the costs and benefits of improved land management practices in three watershed areas in Ethiopia. International Soil and Water Conservation Research 4:20–29.
[231] Target sites will be identified during project inception.
[232] Ligon E & Sadoulet E. 2007. Estimating the effects of aggregate agricultural growth on the distribution of expenditures. Background Paper for the World Development Report.
[233] van Noordwijk M, Tata HL, Xu J, Dewi S & Minang PA. 2011. Segregate or integrate for multifunctionality and sustained change through rubber-based agroforestry in Indonesia and China. In Nair PKR & Garrity DP (eds) "Agroforestry: The Future of Global Land Use", Springer, The Netherlands pp 69–104.
[234] from several studies occurring across different sites
[235] De Groot RS, Blignaut J, van der Ploeg S, Aronson J, Elmqvist T & Farley J. 2013. Benefits of investing in ecosystem restoration. *Conservation Biology* 27:1286–1293.
[236] Rao NS, Carruthers TJB, Anderson P, Sivo L, Saxby TA, Durbin T, Jungblut V, Hills T & Chape S. 2013. An economic analysis of ecosystem-based adaptation and engineering options for climate change adaptation in Lami Town, Republic of the Fiji Islands. A technical report by the Secretariat of the Pacific Regional Environment Programme. Apia, Samoa.
[237] also referred to as 'The National Action Plan on Climate Resilience'
[238] NAPCC 2003.

to all three project outcomes. Other significant plans that align to project outcomes include the National Environmental Action Plan (NEAP)[239,240] and the National Programme of Actions to Combat Desertification (NPACD)[241].

More recently, policies and strategies have moved to incorporating specific climate change terminology. These include the latest poverty reduction strategy, 'Living Standards Improvement Strategy of Tajikistan for 2013–2015' (LSIS)[242], which links water resource management and agricultural reform to a wider reduction in poverty. The 2011 'Strategic Program for Climate Resilience'[243] is another synergistic programme that includes agriculture and SLM as one of its six focal components. The most recent National Development Strategy (NDS)[244] reiterates the vulnerability of Tajikistan to climate change and advocates for the reduction and mitigation of the negative effects of climate change across multiple sectors. This strategy also identifies the centrality of agricultural productivity, water resources and capacity building to realise the targeted socio-economic growth by 2030.

Several of the more recent national strategies and policies in Tajikistan have already expired without renewal, for example NEAP 2011–2015. Other national strategies have been planned and approved but never implemented because of financial constraints, for example the State Programme on the Protection of River Banks[245].

The GoT has made significant progress within its water sector by developing the Water Sector Reforms Programme for 2016–2025 (Water Reform Programme)[246]. While the programme is likely to modernise water management in Tajikistan, it does not adequately consider the impacts of climate change on the water sector. Furthermore, the focus of the Water Reform Programme is restricted largely to water resources management and does not adequately consider the impacts of multiple hazards at the river basin and watershed level. While flood management will be the responsibility of the RBOs established under the programme, other climate-linked hazards such as erosion and landslides are not addressed through its implementation[247].

The proposed project aligns with these national priorities by promoting the climate resilience of rural Tajik citizens through the integrated management of climate vulnerable catchments and watersheds by using EbA methods. Watershed restoration using EbA will strengthen the provision of ecosystem services. These ecosystem services support both soil stabilisation as well as water retention and groundwater infiltration. Consequently, activities under the project will support and safeguard the livelihoods of Tajik farmers by reducing the climate change-related impacts of erosion and landslides. The EbA interventions that have been selected will also generate a number of co-benefits that will improve the livelihoods of Tajik farmers. These co-benefits will include improved agricultural productivity and income diversification.

Table 10 outlines the relevant national and sub-national strategies, plans and programmes that relate to project activities. For each, alignment to project outcome level is indicated.

Table 10. Consistency of project outcomes with national policies, plans, strategies and development goals.

Strategy	Year enforced	Alignment
National strategies		
National Development Strategy 2016–2030 (NDS)[248]	2016	The primary focus of the NDS is on the long-term development of Tajikistan to improve living standards for the population. NDS objectives to achieving this include: i) poverty eradication; ii) sustainable economic growth; iii) promotion of sustainable consumption and production patterns; and iv) sustainable use of natural resources.

[239] also referred to as 'The National Action Plan for Environmental Protection'
[240] National Environmental Action Plan (NEAP). 2006. Government of Tajikistan.
[241] National Program of Actions to Combat Desertification (NPACD). 2001. Government of Tajikistan.
[242] LSIS 2013.
[243] Strategic Program for Climate Resilience (SPCR). 2011. Government of Tajikistan.
[244] NDS 2016.
[245] The State Programme on the Protection of River Banks is detailed in the Intended Nationally Determined Contribution (INDC) towards the achievement of the global goal of the UN Framework Convention on Climate Change (UNFCCC) by the Republic of Tajikistan.
[246] Water Reform Programme 2015.
[247] Water Reform Programme 2015.
[248] NDS 2016.

Strategy	Year enforced	Alignment
		The vulnerability of the Tajik population to climate change is acknowledged throughout the NDS, with the importance of agriculture and water management to alleviating this highlighted. Outcome 1 and 2 of the project therefore align with achieving the ultimate goal of the NDS in the country.
National Strategy and Action Plan on the Conservation and Sustainable Use of Biodiversity (CBD Strategy)[249]	2003	Several interconnected components contribute to the primary objective of the CBD Strategy. A priority element of the 'geo-system-level approach' outlined in the CBD Strategy is the restoration and reforestation of degraded landscapes to reduce soil erosion, particularly in landslide and already eroded areas. Outcome 2 is aligned with this strategic component through implementing EbA activities that contribute to restoration and reforestation in degraded landscapes.
National Strategy on Disaster Risk Management for 2010–2015 (NDRMS)[250]	2010	The NDRMS identifies the significance of climate change-related disasters in the country such as droughts and high-water events. It is also acknowledged in the strategy that mitigation for these types of events needs to be incorporated into the design phase of new development projects. The project is therefore aligned with the NDRMS under Outcome 1, relating to integrated catchment management which includes the improvement of water monitoring systems.
The National Climate Change Adaptation Strategy (NCCAS)[251]	2016	Within the NCCAS there are guidelines provided for priority adaptation actions to be undertaken in Tajikistan. The proposed project is well-aligned with the NCCAS because they both recognise that climate change effects on the agricultural sector result in significant negative impacts for the population. The NCCAS also recognises the potential of EbA as an effective adaptation approach. The NCCAS is currently in draft format and has not yet been accepted by the government. Notwithstanding this information, the proposed project is aligned with the NCCAS through both Outcome 1 and 2.
Living Standards Improvement Strategy for the Republic of Tajikistan for 2013–2015 (LSIS)[252]	2013	LSIS recognises the cross-cutting nature of climate change adaptation in relation to environmental sustainability, economic growth and reducing poverty. The importance of water, soil quality and improving the capacity to collate and disseminate climate change information are also identified as important fields for poverty reduction. In this regard, all three outcomes of the project align with LSIS objectives.
National programmes and plans		
National Program of Actions to Combat Desertification (NPACD)[253]	2001	Outcome 2 of the project aligns with the NPACD focus on 'rational land tenure' and 'measure on rational nature using'. These focal points refer to the sustainable use of natural resources, with clear guidelines on reforestation and mitigating the effects of water erosion. Outcome 3 aligns with two further objectives of the NPACD, namely: i) the development of better platforms to disseminate climate change information; and ii) increasing the role of the local population in collecting and collating data.
Strategic Program for Climate Resilience (SPCR)[254]	2011	The SPCR was developed in response to the specific vulnerability of Tajikistan to climate change and the associated economic, environmental and social impacts. It is the strategic overview of the Pilot Programme for Climate Resilience (PPCR), which consists of six core components. One of these core components is 'Agriculture and

[249] CBD Strategy 2003.
[250] National Strategy on Disaster Risk Management for 2010–2015 (NDRMS). 2010. Republic of Tajikistan, Dushanbe.
[251] NCCAS 2016.
[252] LSIS 2013.
[253] NPACD 2001.
[254] SPCR 2011.

Strategy	Year enforced	Alignment
		sustainable land management', which focusses on incorporating climate resilience into all sectors of land management. Outcome 2 of the proposed project has a strong alignment with this component.
National Action Plan for Climate Change Mitigation (NAPCC)[255,256]	2003	The NAPCC is the only strategic framework in the country that specifically addresses the implications of climate change. All outcomes of the project are strongly aligned with the NAPCC.
National Environmental Action Plan (NEAP)[257,258]	2006	The NEAP focusses on a broad spectrum of current environmental concerns, many of which are likely to be exacerbated by climate change. Amongst the most prevalent concerns included in the NEAP include: i) soil erosion; ii) deforestation and land degradation; iii) high water events; and iv) water scarcity. Outcome 1 and 2 of the project align with these concerns. The NEAP also recognises the need to improve environmental knowledge in Tajikistan at both institutional and local levels, which is complemented in Outcome 3 of the project.
Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme)[259]	2015	Under the Water Reform Programme, the GoT is initiating a shift towards managing water resources according to hydrographic rather than administrative boundaries. Further to this, the programme aims to promote the implementation of Integrated Water Resources Management (IWRM) at the basin level. IWRM was specifically defined for Tajikistan as being: *"based on the interaction of various sub-sectors with the objective good accessibility to high quality water and sanitation services for the population, ensuring water availability for irrigation, hydropower, environment and other users in river basins defined by hydrographic boundaries. IWRM promotes the protection of water resources from over-exploitation and pollution; provides protection of vulnerable mountain environments including river banks and floodplains from flooding and erosion, and facilitates public participation in decision-making, planning, financing and development of water resources in the interests of economic growth, sustainable development of the society and preservation of the environment."* [260] River Basin Organisations (RBOs) and River Basin Councils (RBCs) will be established in each of the six identified basins, as well as in sub-basins as required. RBOs will mainly be responsible for: i) planning the use and protection of water resources annually and in the long-term; and ii) monitoring the distribution of water as well as the state of rivers. RBCs will mainly be responsible for reviewing the plans developed by the RBOs and managing interactions with stakeholders such as water users and Water User Associations (WUAs). RBOs are expected to become operational in 2019, with the GoT being expected to allocate ~US$160,000 annually towards the operation of RBOs and RBCs. Outcome 1 aligns with the Water Reform Programme in involving RBOs and RBCs in developing an integrated catchment management strategy for the KRB.
Agricultural Reform Programme of the Republic of Tajikistan for 2012–2020[261]	2012	The Agricultural Reform Programme includes a direct focus on mitigating the negative impacts of climate change for agricultural production. This includes the primary activity of 'systematic reduction of soil erosion, land degradation and deforestation by improving natural resources management'. The programme includes a focus on EbA strategies with emphasis on soil erosion activities.

[255] NAPCC 2003.
[256] also referred to as 'The National Action Plan on Climate Resilience'
[257] NEAP 2006.
[258] also referred to as 'The National Action Plan for Environmental Protection'
[259] Water Reform Programme 2015.
[260] Water Reform Programme 2015.
[261] Agricultural Reform Programme for 2012–2020 of the Republic of Tajikistan. 2012. Ministry of Agriculture, Government of Tajikistan.

Strategy	Year enforced	Alignment
		Both Outcome 1 and 2 of the project align with these focal points of the Agricultural Reform Programme. Another important component of the programme is the 'development and establishment of information management systems that would enable communities, local and national authorities to effectively collect, record and analyse reliable information on the impact of natural disasters and climate change'. Outcome 3 of the project is strongly aligned with this component.
Strategies with a focus on climate change		
Greenhouse Gas Abatement Strategy (GHG Strategy) included in the NAPCC[262]	2003	In order to meet the UNFCCC commitments for Tajikistan, the GHG Strategy was developed with the focus to address the problem of source-based anthropogenic emissions. Outcome 2 of the proposed project aligns with the objective of promoting sustainable forms of agriculture in light of climate change considerations. Additionally, Outcome 2 aligns the priority of enhancing natural sinks of carbon including forests and soils.
Strategy of Adaptation to Climate Change, Prevention and Minimization of its Adverse Effects (Adaptation Strategy) included in the NAPCC[263]	2003	In order to meet the UNFCCC commitments for Tajikistan, the Adaptation Strategy was included within the NAPCC to ensure that climate change adaptation remained a focal point for development in the country. Outcome 2 and 3 of the project align with the following components of the strategy: • improvement of systematic observation and monitoring network for ensuring timely adjustment of adaptation measures; and • improvement of the data collection system and analysis, interpretation and dissemination of the results among the end users. Outcome 1 of the project is aligned with two of the priorities relating to water resources: • development of measures in the field of water resources protection, water and energy saving in the conditions of climate change; and • development of new, and improvement of existing technical and economical tools on water use at national and regional levels. In addition, Outcome 2 of the project aligns with four of the five 'measures of adaptation and minimisation of adverse impacts of climate change' relating to land use. These are listed below. • Zoning of territory depending on the extent and type of influence of climatic factors on the condition of lands taking into account its vulnerability to the different forms of erosion. • Setting a selection of soil protection measures for specific landscapes according to the influence of climatic and anthropogenic factors. • Conducting land-reclamation measures, which include crop rotation, soil protection and limiting the ploughing of steep lands that will help to conserve the humus in the soils under the expected conditions of climate change. • Forest rehabilitation measures in the regions prone to drought and wind erosion.
Laws		
Land Code of The Republic of Tajikistan (Land Code)[264]	1996	The Land Code regulates all land relations and is directed at the rational use and protection of land. This focus is targeted to improve the fertility of soil, and to maintain and improve the natural environment. In this way, opportunities for equal development of all forms of economic activity will be promoted in Tajikistan.
Water Code of The Republic of	2000	The Water Code is aimed at regulating water relations to ensure rational use. This is so that there is adequate supply for the needs of the population and the natural environment.

[262] NAPCC 2003, Section 8: Greenhouse Gas Abatement Strategy.
[263] NAPCC 2003, Section 9: Strategy of Adaptation to Climate Change, Prevention and Minimization of its Adverse Effects.
[264] Land Code of the Republic of Tajikistan (Land Code). No. 498 of 1997. Republic of Tajikistan.

Strategy	Year enforced	Alignment
Tajikistan (Water Code)[265]		
Law of the Republic of Tajikistan on Land Reform (Land Reform Law)[266]	1994	The Land Reform Law includes tasks listed by the GoT specifically for further developing land management. These tasks are all designed with the purpose to increase the agricultural production of the country and include the: i) creation of optimal conditions for equal rights; ii) development of various forms of land management; iii) formation of a multi-structural economy; iv) rational use; and v) the protection of land.
Law of the Republic of Tajikistan on Land Management (Land Management Law)[267]	2001	The objective of the Land Management Law in Tajikistan is to create conditions for equal development for all sector in the country.
Law About Environmental Protection	2011	This law provides the legal base for developing the state policy on environmental protection. Further to this, it aims to conserve the natural resources of the country and ensure the environmental sustainability for socio-economic development. Therefore, the law ensures that the human right to a healthy environment is guaranteed.
Law on Ecological Expertise	2012	The law defines principles and norms for environmental experts to adhere to and provides for the prevention of negative impacts on planned economic interventions on environment.
Law on the Republic of Tajikistan on *Dehkan* Farms (*Dehkan* Law)[268]	2016	This law defines the legal base for establishing and maintain the efficient functioning of *dehkan* enterprises. In addition, the law aims to create an enabling environment for the development of farming in the country.

E. Consistency with national technical standards

The proposed project is aligned with the requirements of the March 2016 Revision of the Environmental and Social Policy (ESP) of the Adaptation Fund (see Part II: K)[269]. Prior to project approval, the Full Proposal will be screened according to the UNDP Social and Environmental Safeguards Procedure[270]. This is to ensure that the necessary safeguards have been addressed and incorporated into the project design.

In addition to complementing the efforts of the CEP and the GoT to improve catchment management in the KRB, project activities will increase rural Tajik resilience to climate change in throughout the country. The Adaptation Fund-accredited Implementing Agency, UNDP, together with CEP and relevant national partners, will ensure that the project follows procedures outlined in the ESP. This includes the requirement that project activities funded by the Adaptation Fund reflect local circumstances and needs and draw upon national actors and capabilities.

The project will also adhere to all relevant national technical standards. At the Full Proposal development stage, the following legislation has been identified with relevance to the proposed activities:

- the 1996 Land Code of The Republic of Tajikistan[271];
- the 2000 Water Code of The Republic of Tajikistan[272];
- the 2001 Law of the Republic of Tajikistan on Land Management[273];
- the 2001 Law About Environmental Protection; and
- the 2012 Law on Ecological Expertise.

The relevance of each legislation to the project activities is detailed in Annex 4, Section 2.

[265] Water Code: Law of the Republic of Tajikistan (Water Code). 2001. Government of Tajikistan, Dushanbe.
[266] Republic of Tajikistan Law on Land Reform (Land Reform Law). 1994. Republic of Tajikistan.
[267] Law of the Republic of Tajikistan "on Land Management" (Land Management Law). 2001. Republic of Tajikistan.
[268] Republic of Tajikistan Law "on *Dehkan* Farms" (*Dehkan* Law). 2002. Republic of Tajikistan.
[269] Refer to Part II: K on the environmental social impacts and risks of the project.
[270] UNDP Social and Environmental Safeguards Procedure.
[271] Land Code 1997.
[272] Water Code 2001.
[273] Land Management Law 2001.

Technical standards and relevant manuals or guidelines for project activities are listed below. All project activities will conform with the relevant national standards and guidelines where applicable.

Table 11. Proposed activities with applicable national technical standards or regulations

No.	Description	Relevant national standard, guideline or regulation
1	Construction of 'protection' gabions along rivers to provide buffers during flash floods.	Construction norms and standards on agro-industrial complex (SNIP) 2.30.05.001-03 Construction norms and standards on erosion-resistant gabion structures (SNIP) R 52132-2003 State standard on products produced for gabion structures. Twisted wire nets with hexagonal cells for gabion structures. Technical standard R 51285-99 Construction norms and standards on bank protection (SNIP) 4.02-91
2	The introduction of water-saving irrigation techniques such as drip irrigation, dry farming, composting/mulching and making use of cover crops.	Manual on drip irrigation
3	Rehabilitation/restoration of degraded forest ecosystems making use of *saxaul* species, as well as others.	Manual on establishment of saxaul plantations and soil stabilization
4	Sustainable harvesting for livelihoods from existing 'healthy' forest ecosystems.	N/A
5	Establishing livestock exclusion zones for the growing of fodder crops such as Lucerne and sainfoin.	Pasture Law of the Republic of Tajikistan Guidance on sowing lucerne and sainfoin.
6	Establishing shelterbelts to reduce the deposition of wind-eroded sediment on crops and integrating bio-drainage measures to improve water infiltration.	Manual on establishment of shelterbelts and bio-drainages.
7	Introducing indigenous and palatable grass seeds into degraded rangelands.	N/A
8	Introducing rotational grazing of livestock between pastures to assist with increasing field water absorption and decreasing water runoff.	Pasture Law of the Republic of Tajikistan.
9	Pasture management such as land-use planning and introducing improved management measures such as exclusion zones and rotational grazing of livestock.	Pasture Law of the Republic of Tajikistan.
10	Establishing joint forest management involving communities and local government.	Forestry Code of the Republic of Tajikistan Manual on establishment of Joint Forest Management Committee.
11	Introducing intercropping and agroforestry, and in specific	Forestry Code of the Republic of Tajikistan Manual on establishment of commercial plantations.

No.	Description	Relevant national standard, guideline or regulation
	areas may include apiculture, i.e. beekeeping.	
12	Introducing sustainable long--term community services such as renewable energy and energy-efficient stoves.	Guidance on manufacturing of energy-efficient stoves.
13	Setting up shelterbelts in areas frequently exposed to erosion.	Manual on establishment of shelterbelts.
14	Establishing commercial plantations making use of an array of indigenous fruit species in degraded lands.	Forestry Code of the Republic of Tajikistan Manual on establishment of commercial plantations.
15	Introducing organic mulching for farmers to use on croplands which promotes soil fertility as well as water-saving.	Manual on mulching.
16	Diversifying crop use, including drought-tolerant and climate-resilient crops.	N/A
17	Establishing greenhouses for horticulture including local lemon, tomato and cucumber.	Manual on establishment of the greenhouses and growing citrus fruits.
18	Establishing community woodlots in abandoned areas for fuelwood.	Forestry Code of the Republic of Tajikistan Manual on establishment of commercial plantations.
19	Providing additional and improving existing extension services provision which will include developing advisories for farmers.	Manual on establishment of Field Farmer Schools and extension services.
20	Establishing on-farm water resource management.	Law on establishment of Water User's Association.
21	Rehabilitating existing irrigation, drainage and pumping systems.	Construction norms and standards on hydrotechnical facilities: (SNIP) 33-01-2003. Construction norms and standards on meliorative systems and facilities: (SNIP) 3.07.03-85. Construction norms and standards on foundations of hydraulic engineering structures (SNIP) 2.02.02-85 Construction norms and standards on trunk pipelines (SNIP) 2.05.06-85 Construction norms and standards on technological equipment and technological pipelines (SNIP) 3.05.05-84

Given the small scale of the project's EbA interventions in the target sites and communities, as well as their focus on environmental protection, Environmental Impact Assessments (EIAs) are not expected to be necessary for any of the planned interventions. In addition, the proposed projects activities are in line with national social norms, including gender equality and equal access.

F. Duplication in project design

There are a number of adaptation projects being implemented in Tajikistan with varying but similar objectives, including livelihood improvement, disaster risk reduction (DRR) and building climate resilience. The proposed project will complement these existing projects. In particular, there are three ongoing initiatives in the country that project activities will complement. These ongoing projects include: i) 'Livelihood Improvement in Tajik-Afghan Cross-border Areas' (LITACA); ii) 'Strengthening Disaster Risk Reduction and Response Capacities'; and iii) 'Facilitating Climate Resilience in Tajikistan'. Brief outlines of these projects are provided below. In addition to an overview of each project, justification is provided for why the project will not be a duplication of the respective projects' efforts.

During implementation of project activities, a team will work closely with the project representatives – as well as other relevant initiatives – to identify the best possible opportunities for enhancing complementarity. Table 11 outlines the alignment between ongoing projects and proposed project activities in Tajikistan.

Table 11. Alignment of current and ongoing initiatives in Tajikistan with the proposed project.

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
Livelihood improvement in Tajik-Afghan cross-border areas, Phase II (LITACA)[274]	**Fund:** Government of Japan (GoJ) **Fund grant:** US$10,559,227 (US$3,600,000 Tajikistan portion) **Timeline:** 2018–2020	The LITACA project is the logical continuation of the successes and lessons of the LITACA Phase I Project which took place between 2014 and 2017. Phase II aims to build on the results of Phase I by further strengthening the living standards of selected rural communities in the bordering areas of Tajikistan and Afghanistan. The project aims to improve living standards, stability and security through: i) reduced poverty, supported economic development; and ii) cross-border collaboration among the communities along the Tajik-Afghan border.	• Activities implemented under LITACA are partially linked to agriculture for example rehabilitation of irrigation facilities and efficient of water management/use. Best practices and lessons learned on agricultural activities and capacity-building of people in rural settings, particularly women, can contribute to knowledge sharing. • The LITACA project is supporting community-based infrastructure in Shaartuz and Kabodiyon. • Activities under the proposed project in the same geographical region as the LITACA project will benefit from: i)improved local infrastructure, particularly for irrigating agroforestry plots, fodder crops and other productive EbA interventions; and ii) capacity building activities with local service providers to manage local infrastructure (e.g. water supply, sanitation, irrigation and agricultural facilities).	The proposed project will expand the best practices and lessons learned on strengthening community livelihoods through the creation of enterprises based on ecologically-sound EbA activities. Additionally, the project will provide a platform for activities similar to those in the LITACA project to be applied at a watershed and catchment-scale to build climate resilience in the KRB.
Strengthening disaster risk reduction and response capacities[275]	**Fund:** Government of Japan (GoJ) **Grant:** US$10,600,000 **Timeline:** 2016–2020	This project will support the Government of Tajikistan (GoT) to undertake a nation-wide risk assessment, establish and implement risk reduction measures and improve early warning. In addition, it will enhance the population's resilience to natural and man-made disasters by improving policy and operational frameworks for environmental protection and	• Best practices and lessons learned on climate risk-reduction interventions can contribute to knowledge sharing. • Risk management responses from this GoJ project have informed the selection of EbA measures in the proposed project.	The proposed project will use lessons learned and best practices from this GoJ-funded project for on-site risk management practices. These lessons learned and best practices will be included in watershed and catchment-level planning for building climate resilience. Furthermore, the proposed project will generate additional climate risk

[274] UNDP. 2018. Livelihoods Improvement in Tajik-Afghan Cross-Border Areas Phase II Project (LITACA II). Available at: Livelihoods Improvement in Tajik-Afghan Cross-Border Areas Phase II Project (LITACA II)
[275] UNDP. 2018. Strengthening Disaster Risk Reduction and Response Capacities in Tajikistan. Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/crisis_prevention_and_recovery/strengthening-disaster-risk-reduction-and-response-capacities-in.html

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
		sustainable management of natural resources.		transparency by taking a multi-hazard risk identification approach.
Improved DRR Policy Making Mechanism. Strengthening Disaster Risk Governance in Tajikistan (SDRGT)[276]	**Fund:** Swiss Agency for Development and Cooperation **Grant:** US$820,000 **Timeline:** 2016-2019	The project aims to reduce the negative human and material impact of disasters in Tajikistan by improving the management of governance of these disaster risks through: i) expanding approaches to risk governance at the national level involving the government and the international community; and ii) improving local risk governance using risk assessments, risk information-based land use planning and risk communications targeting land owners and users by selected local governments.	• Efforts applied in this project are linked to increasing awareness of specific river basin organizations (RBOs) on managing water-based risks (e.g., floods and drought) at and below the watershed level and linking local and RBO-level water-based risk management.	Lessons learned and best practices from will be applied by this proposed project for developing multi-hazard climate risk models. In addition, existing RBOs will be capacitated to strengthen coordination and training mechanisms for watershed- and catchment-level planning and management. Further to improving the management of water-based risks, RBOs will be equipped to manage the risks of other climate-linked hazards such as erosion and landslides.
Facilitating climate resilience in Tajikistan[277]	**Fund:** Government of Russian Federation (GoRF) **Grant:** US$950,130 **Timeline:** 2018–2020	Through the effective use of climate and disaster risk information, this project aims to facilitate access to climate finance for communities in disaster-prone mountainous regions of Tajikistan. The climate-resilience of these communities will therefore be enhanced.	• Information from community consultations will contribute to existing understanding of community preferences for risk management options. • Best practices and lessons learned on climate risk-reduction interventions can contribute to knowledge sharing.	The proposed project activities will be informed by lessons learned from the GoRF-funded project and integrate these into catchment-scale climate risk management.
Kofirnighan River Basin Plan and Management Plan (KRBMP)[278]	Unpublished March 2018 draft authorised by the Fergana Valley Water	The KRBMP will support the GoT in implementing the Water Sector Reform Programme for 2016–2025 by developing	• Focused information on sustainable water resources management in the KRB can contribute to the development of basin-specific catchment management strategies.	While the KRBMP will introduce a catchment approach to water resources management in the KRB, this plan will not

[276] UNDP. 2018. Strengthening Disaster Risk Governance in Tajikistan . Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/crisis_prevention_and_recovery/strengthening-disaster-risk-governance-in-tajikistan.html

[277] UNDP. 2018. Facilitating Climate Resilience in Tajikistan . Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/crisis_prevention_and_recovery/facilitating-climate-resilience-in-tajikistan.html

[278] Fergana Valley WRM 2018 KRBMP Unpublished.

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
	Resources Management **Timeline:** 2018–2019	institutional mechanisms to improve water resources management at the basin- and local-level in the KRB. It also aims to develop a long-term basin plan for the use, protection and development of water resources, as well as annual or seasonal plans for the distribution and management of KRB water resources.	• Watershed delineation that is expected to be delivered through the development of the KRBMP will be utilised by the proposed project.	consider the integrated management of land and water resources for climate resilience. The proposed project will expand on the KRBMP by demonstrating an integrated approach to managing climate risks within a catchment through the use of EbA. Such management will take the upstream – downstream linkages of climate change risks into account. The proposed project will also demonstrate how to effectively manage rural watersheds to yield catchment-wide adaptation benefits.
Building climate resilience of vulnerable and food insecure communities through capacity strengthening and livelihood diversification in mountainous regions of Tajikistan[279]	**Fund:** Green Climate Fund (GCF) **Fund grant:** US$9,300,000 **Partner:** World Food Programme (WFP) **Partner grant:** US$346,000 **Timeline:** 2018–2022	This initiative will introduce adaption measures to address climate change effects leading to declines in agricultural yields, increases in food prices and reduced agricultural wages. It will focus on the most vulnerable and food insecure communities in the Rasht valley, Khatlon and Gorno-Badakhshan Autonomous Region (GBAO) regions.	• Possibility for using data, methodologies and practices related to SLM in the proposed project. • Geographical overlap in the south of the KRB.	Many of the activities in the proposed project align with the objectives of the WFP project. The proposed project will provide additionality by promoting a catchment management approach to the implementation of adaptation measures in agriculture. This will ensure that the interventions proposed in the WFP project are implemented strategically, so as to manage climate risks. Such catchment-level risk management measures will also de-risk the investments of the WFP project and increase the WFP project's sustainability and scalability.

[279] Green Climate Fund (GCF). 2018. Project FP067: Building climate resilience of vulnerable and food insecure communities through capacity strengthening and livelihood diversification in mountainous regions of Tajikistan. Projects and programmes. Available at: https://www.greenclimate.fund/ [accessed 11.07.2018].

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
Tajikistan: building climate resilience in the Pyanji River Basin[280]	**Fund:** Strategic Climate Fund **Grant:** US$21,550,000 **Timeline:** 2013–2020	The project aims to increase resilience to climate vulnerability and change of communities in the Pyanj River Basin. The project's impact will be improved livelihoods of Pyanj River Basin communities vulnerable to climate variability and change.	• Useful information and practices on diversified livelihoods to contribute to knowledge sharing.	The Strategic Climate Fund project aims to rehabilitate infrastructure in the Pyanji River Basin and does not include any EbA components or components that will strengthen planning for climate risk management. Activities under the proposed project will largely focus on introducing an EbA approach to the KRB, as well as introducing and integrated climate risk management approach at a catchment level. The two projects are complementary in that both will achieve climate resilience benefits
Climate adaptation through sustainable forestry in important river catchment areas in Tajikistan (CAFT)[281]	**Fund:** KfW Development Bank **Grant:** US$9,884,880 **Timeline:** 2015–2018	Rehabilitation, conservation and sustainable use of forests contribute to the adaptation of the country to climate change and the conservation of biodiversity, as well as to the improvement of livelihoods of the local population in the project areas.	• Useful information and practices on the use and management of agro-biodiversity conservation. • Information and best practices for conservation and adaptation management for replication in other areas of the country.	Lessons learned and best practices will be used to inform several activities of the proposed project, particularly EbA interventions involving plant establishment (for example forest restoration, sustainable harvesting, forest management, agroforestry, and the establishment of shelterbelts and woodlots). In addition, support for the development of Enterprise Plans (EPs) for community members will be provided by the proposed project to promote the sustainability of ecologically-sound natural resource-based businesses.

[280] Asian Development Bank (ADB). 2018. Tajikistan: Building Climate Resilience in the Pyanj River Basin. Sovereign (Public) Project 45354–002. Available at: https://www.adb.org/projects/45354-002/main#project-pds [accessed 11.07.2018].
[281] GIZ. Adaptation to climate change through sustainable forest management. Available at: https://www.giz.de/en/worldwide/29916.html

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
Tajikistan: Water Resources Management in Pyanj River Basin Project[282]	**Fund:** ADB **Grant:** US$25,000,000 **Partner:** Japan Fund for Poverty Reduction **Partner grant:** US$5,000,000 **Timeline:** 2016–2022	The project aims to improve institutional and physical capacities of water resources management (WRM) system in PRB of southern Tajikistan. In particular, it will implement a Pyanji River Basin Management Plan, as well as improving irrigation infrastructure and water management practices.	• The ADB-funded project has a similar outcome to the KRBMP mentioned above. Complementarities between the ADB-funded project and the proposed project will mainly be through knowledge sharing across two river basins.	The proposed project is expected to contribute lessons learned about catchment management that considers both land and water resources management to all river basins in Tajikistan, including the Pyanji River Basin.
Strengthening Critical Infrastructure against Natural Hazards[283]	**Fund:** International Development Association (IDA) Grant **Fund grant:** US$25,000,000 **Partner:** IDA **Partner grant:** US$25,000,000 **Timeline:** 2017–2023	The objectives of the Strengthening Critical Infrastructure Against Natural Hazards Project for Tajikistan are to strengthen the recipient's disaster risk management capacities, enhance the resilience of its critical infrastructure against natural hazards, and improve its capacity to respond to disasters.	• Potential for information and best practices to be shared.	The proposed project will provide additional risk management and risk identification approaches. Specifically , the proposed project will introduce multi-hazard risk models and EbA as a risk management approach to the KRB. The IDA-funded project does not consider EbA and focuses largely on irrigation and drainage, as well as road infrastructure.
Aid for Trade in Central Asia Project, Phase IV[284]	**Fund:** Government of Finland **Grant:** US$2,500,000 (Tajikistan portion) **Timeline:** 2018–2022	The project aims to support Central Asian countries in promoting inclusive and sustainable growth patterns in rural areas and within green productive sectors. The project works on the macro (policy), meso (institutions) and micro (SMEs and producers) levels ensuring that interventions at the three levels are mutually supportive to ensure a focused impact level. The output levels target the following:	• Five of the project's fish farms occur within three districts of the proposed project: Varzob, Gissar/Karatag, Romit/Vahdat. These businesses are highly vulnerbale to climate change impacts and are particularly dependant on water resources in the KRB. • The project is supporting value chains for greening via various project activities including: green loans, energy efficiency introduction at processing/production SMEs, green farming and introduction of International Standards.	The vulnerability of natural resource-based value chains to climate change impacts will be reduced through the implementation of project activities such as EbA interventions designed to increase ecosystem services.

[282] ADB. 2018. Tajikistan: Water Resource Management in Pyanj River Basin Project. Sovereign (Public) Project 47181–002. Available at: https://www.adb.org/projects/47181-002/main [accessed 11.07.2018].
[283] The Word Bank. 2018. Available at: http://projects.worldbank.org/P158298?lang=en [accessed 23.07.2018].
[284] UNDP. 2018. Wider Europe: Aid for Trade in Central Asia: Phase III. Available at: http://www.tj.undp.org/content/tajikistan/en/home/operations/projects/poverty_reduction/aid_for_trade_II.html

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
		• Supporting an enabling environment for job-rich sustainable growth; and • Supporting market opportunities for all through more efficient and competitive producers and processors. Two cross-cutting themes are gender equality and environmental sustainability.		
Biodiversity and ecosystem services in agrarian landscapes[285]	**Fund:** GIZ **Grant:** US$4,650,000 **Timeline:** 2016–2020	The project aims to strengthen individual and institutional capacities and knowledge on increasing biodiversity and sustainable use of ecosystem services in agrarian landscapes (two villages in Ayni and three in Rasht Valley).	• Both projects include the use of ecosystem restoration in agrarian landscapes. Consequently, lessons learned on ecosystem interventions are expected to be shared between the two projects.	The proposed project will be implementing EbA strategically at the watershed and river basin scale to reduce the impacts of future climate change. This will provide valuable lessons learned about integrating EbA into climate-resilient catchment management in Tajikistan.
Central Asia Hydrometeorology Modernization Project (CAHMP)[286]	**Fund:** International Development Association (IDA), and Climate Investment Fund **Grant:** US$27,700,000 **Timeline:** 2018–2021	The project aims to improve the accuracy and timeliness of hydrometeorology services in Central Asia, with particular focus on the Kyrgyz Republic and Republic of Tajikistan.	• Useful information on climate change in Tajikistan for improving hydrometeorology services. • Potential for information and best practices to be shared regarding the development of the National Strategy on climate change adaptation and sectoral action plans on adaptation.	Accurate, basin- and watershed-level data will be generated from rehabilitated or newly-established weather stations within the KRB. Data and information from these weather stations, in additon to that from several other sources, will be collated and disseminated to promote the implementation and adaptive management of climate-resilient integrated catchment management within the KRB.

[285] GIZ. Biodiversity and ecosystem services in agrarian landscapes. Available at: https://www.giz.de/en/worldwide/52789.html
[286] The World Bank. 2018. Central Asia Hydrometeorology Modernization Project. Available at: http://projects.worldbank.org/P120788/central-asia-hydrometeorology-modernization-project?lang=en&tab=financial

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
Transboundary water management in Central Asia[287]	**Fund:** GIZ **Grant:** US$ unknown **Timeline:** 2009–2019	Phase III of the programme (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) focuses primarily on strengthening regional institutions and sustaining the experiences gained in the previous phases. The programme supports the Central Asian institutions regulating matters of water distribution at the regional level. Overall, the programme: i) strengthens the political position of institutions in the region; ii) advises on the formulation of legal provisions and guidelines; and iii) supports the development of practical measures for integrated water resources management.	• Activities are complemented by a number of pilot projects in selected river basins, which demonstrate the potential benefits of improved water use. • Useful information on irrigated agriculture across the region addresses: i) improved availability and predictability of water; ii) better functioning infrastructure; and iii) better planning for natural hazards.	The proposed project will implement lessons learned and best practices generated by this project. In addition, the proposed project will contribute to improving watershed- and basin-level aspects of water resource management, associated infrastructure (such as weather stations), and multi-hazard climate risk management.
Regional programme for sustainable and climate sensitive land use for economic development in Central Asia[288]	**Fund:** GIZ **Grant:** US$ unknown **Timeline:** 2016–2019	The programme aims to support government agencies and the private sector in Central Asia adopt integrated, economically and ecologically sustainable forms of land use, taking climate change into account. The programme pursues activities in six areas: pasture, forests, environmental economics, climate change adaptation, knowledge management, and environmental education and awareness raising. The project aims to support regionally adapted approaches	• The regional pasture network launched within this project will serve as a platform for information exchange (using the modern and convenient online data management system)	The sustainability of natural resource-based businesses within the KRB (that are ecologically-sound and climate-resilient) will be increased through *inter alia* capacity building, the development of Enterprise Plans (EPs) and the provision of agro-ecological extenson sevices. In addition, through the proposed projects component on knowledge management, the evidence-base generated by the project has the potential to facilitate

[287] GIZ. Transboundary water management in Central Asia. Available at: https://www.giz.de/en/worldwide/15176.html

[288] GIZ. Sustainable and climate sensitive land use for economic development in Central Asia. Available at: https://www.giz.de/en/worldwide/14210.html

Project title	Fund, grant amount(s) and timeline	Objective	Alignment with proposed project	Additionality of the proposed project
		for the participatory and sustainable management of land resources with a focus on the integration of different forms of land use, such as pasture and forest management, and their economic valuation at both macro and micro levels (nationwide)		the upscaling of integrated catchment management approach using EbA to other river basins in Tajikistan and the greater Central Asian region.

G. Knowledge management

For details on knowledge management within the proposed project, refer to Component 3 outlined in Part II: A. Component 3 includes activity-specific details on how information-sharing and knowledge management are included in the project design.

Specifically, knowledge-sharing and management has been integrated into the project design through three outputs. These are summarised below.

Under Output 3.1, existing knowledge management centres will be supported through project activities. These existing centres have been selected based on their focus on development work and/or adaptation within Tajikistan. The UCA is a regional academic institution that is focusing its efforts in rural Tajik communities to improve their resilience to climate change. All data collected by the UCA is accessible by the Open Centre under the DoG. The Open Centre is a housing platform for data and information and is available to the public for viewing and use. By supporting both UCA and the Open Centre, the project activities will encourage researchers to access previous and ongoing work to inform future developments. In addition, awareness will be raised among both government, private institutions and communities through providing support to the knowledge centres.

Under Output 3.2, an impact evaluation framework will be conducted that will enable management that is adaptive and integrated.

Both Output 3.1 and 3.2 will then contribute towards the strengthened knowledge exchange practices between communities and government under Output 3.3. Awareness will also be raised through the strengthened interactions between communities and government.

H. Consultation process

A wide range of stakeholders were consulted with during the scoping and validation phase of proposed project development. A consolidated stakeholder consultation report is attached as Annex 1 and an extensive stakeholder consultation report has been prepared. This report is available online via this link.

Importantly, the project's Executing Entity, the CEP, was consulted through the iterative process of refining the project design. As the national organisation responsible for implementing adaptation projects in the country, CEP is comprised of numerous technical experts. Therefore, CEP is well-positioned to ensure that the project design is tailored to local requirements, that it benefits vulnerable groups and includes necessary gender considerations.

A Validation Workshop was held in Dushanbe on 22 June 2018 that included representatives from relevant KRB districts, international organisations, academia and partner projects.

I. Funding justification

Component 1. Integrated catchment management to build climate resilience.

Baseline scenario (without AF resources)

The **baseline scenario** is that rural development in Tajikistan is not informed by an integrated catchment management strategy. Agricultural productivity will continue to decline as increasing climate change impacts accelerate erosion at a landscape scale. Local communities will continue to be exposed to climate hazards because climate risks are not accounted for in district and sub-district planning and development. Climate information and advisories will not be disseminated to local farmers in vulnerable catchments because of a lack of adequate climate information services in Tajikistan.

Additionality (with AF resources)

The **preferred solution** is that a climate-resilient catchment management strategy is developed and operationalised at the district and sub-district level. This strategy will be informed by multi-hazard climate risk models (MHCRMs) and by detailed climate data from automated weather stations. The strategy will detail appropriate risk management approaches for improving resilience to climate risks and identify mechanisms for disseminating advisories tailored to local communities. Local authorities will be capacitated to implement catchment management strategies. The overall climate resilience of rural communities will be increased because of: i) reduced exposure to climate risk as a result of a climate risk management approach to rural development and land management; and ii) increased adaptive capacity as a result of strengthened local government capacity.

Component 2. Ecosystem-based Adaptation, including Climate-smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.

Baseline scenario (without AF resources)

The **baseline scenario** is that ecosystems in rural Tajikistan continue to be degraded as a result of a combined effect of unsustainable land management practices and the impacts of climate change. Ecosystems goods and services will be further compromised by rapid erosion, resulting in declines of agricultural productivity and hydropower generation. Hydrometeorological disasters will continue to increase, as ecosystem services such as soil stabilisation and flood attenuation are further compromised. This will result in increasingly negative impacts on Tajikistan's economy and the health and well-being of its population.

Additionality (with AF resources)

The **preferred solution** is that EbA is implemented by local communities in rural Tajikistan. EbA interventions will provide goods and services that reduce climate change impacts[289] and strengthen rural livelihoods. Agro-ecological extension centres will be supported to ensure they provide relevant technical support to communities on EbA. This support will also ensure that the implementation of interventions will be informed by fine-scale land-use plans.

The sustainability and replicability of EbA interventions will be ensured through the development of a market environment for EbA. Enterprise Plans (EP) will be developed by communities to implement EbA activities that promote climate resilience.

Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.

Baseline scenario (without AF resources)

The **baseline scenario** is that lessons learned and best practices on EbA are not systematically collated. Information on climate risks and EbA will continue to be fragmented. This will hinder the effective implementation of EbA interventions as uncertainty around the effectiveness of EbA interventions will remain. Without an

[289] such as soil stabilisation, flood attenuation and groundwater recharge

appropriate evaluation framework, decision-makers will lack reliable information on the benefits of EbA as well as the effectiveness of different interventions within the local context. Local communities will continue to lack access to comprehensive and reliable information on climate risks and adaptation best practices.

Additionality (with AF resources)

By providing support to existing knowledge management centres, these entities will be responsible for collating, analysing and disseminating information on climate risks and EbA. Providing this support thereby ensures that up-to-date information is accessible in a coherent manner. This information will be disseminated to decision-makers and local communities via appropriate communication channels, to ensure that all stakeholders benefit from information on climate risk and adaptation measures. The knowledge centre(s) will share information with local communities through mass media channels such as mobile applications, websites, brochures and radio broadcasts. They will also engage with existing local knowledge exchange structures. In this way, knowledge on climate risks and EbA will be disseminated broadly and in a locally-appropriate manner.

An impact evaluation framework will be developed under Component 3 that will enable the evaluation of the benefits of EbA interventions. This framework will promote the use of sampling methodologies to ensure the accurate attribution of social, economic and environmental benefits to EbA interventions. The knowledge centre will continue to manage and apply the framework beyond the project lifespan, ensuring that future EbA interventions in Tajikistan are monitored adequately.

J. Sustainability of the project

Project components have been designed to ensure the sustainability and replicability of project benefits in the long term. Specifically, project sustainability will be supported through: i) promoting the active participation of relevant regional[290], national and district level stakeholders in decision-making and implementation of project activities; ii) strengthening institutional and technical capacity at *raion* and *jamoat* levels to ensure that stakeholders have adequate knowledge and skills to maintain the benefits of the project EbA interventions; and iii) raising the awareness of the benefits of integrated catchment management practices, including EbA, CSA and SLM activities, at the village level.

Particular aspects of project sustainability per component are described below.

Component 1 will develop the capacity for catchment management informed by climate risks. Multi-hazard climate risk models (MHCRMs) developed for the KRB in Output 1.1 will inform future planning to develop climate resilience. Such models will then be readily replicable for other catchments across the country. The PES models developed in Output 1.5 will strengthen the sustainability of project interventions by ensuring sustainable financing for climate-resilient management and EbA.

Agro-ecological extensions centres supported and trained under **Component 2** will also contribute to project sustainability. This is because the impacts of the training will continue beyond the lifespan of the project, continuing to provide extension services to local communities. These communities will use these services to inform the implementation and maintenance of EbA interventions, thereby ensuring the sustainability of such interventions. Moreover, EbA interventions are inherently more sustainable than traditional infrastructure, as ecological infrastructure is multi-purpose and flexible. Generally, EbA interventions require less maintenance than non-EbA alternatives and such maintenance can usually be conducted by unskilled labourers. As a result, the proposed interventions will be more likely to be maintained than non-EbA alternatives.

By supporting the knowledge management centre(s) under **Component 3**, it is ensured that's climate information, as well as lessons learned, are accessible for decision-makers and local communities. The impact evaluation framework [under Output 3.2] will enable adaptive management on project interventions and will also allow for accurate attribution of EbA benefits. This will help to demonstrate the cost-effectiveness of EbA, thereby promoting its use to develop climate resilience in communities across Tajikistan.

[290] such as representatives from international UCA campuses

K. Environmental and social impacts and risks

The proposed project activities were evaluated against the Adaptation Fund (AF) Environmental and Social (E&S) Principles to identify potential negative impacts. A detailed analysis on the AF ESP is provided in *Annex 4: Environmental and Social Management Framework (ESMF)*. Results of the assessment of the project according to the UNDP Social Environmental Screening Policy (SESP) and the AF E&S Principles are listed below. The completed UNDP SESP screening template is available in Annex 6: UNDP Social and Environmental Screening Procedure (SESP). The risks presented were compiled using the following baseline documents:

- Project's Environmental and Social Management Framework (ESMF);
- UNDP Social and Environmental Screening Procedure (SESP);
- Project's Consolidated Stakeholder Consultations and Missions Report;
- World Bank (2016). Tajikistan Agriculture Sector Risk Assessment;
- Project's "Marginalized and vulnerable groups/Gender Analysis: Prioritization of vulnerable communities and groups for climate change adaptation interventions in selected districts of Kafernigan River Basin" (UNDP, 2019);
- Project's "Land Use and Climate Change: Restoration of forests and pastures in Kafernigan River Basin: Lessons learned, good practices and recommendations for selected districts".

Table 12 below provides an overview of the types of environmental and social risks of the proposed project.

Table 12: Overview of Environmental and Social Impacts and Risks

Checklist of environmental and social principles	**No further assessment required for compliance**	**Potential impacts and risks – further assessment required for compliance**
Compliance with the Law	The project activities (components and sub-projects) have been designed to comply with relevant national laws, regulations and policies (incl. nationally endorsed programmes and strategies). The project activities adhere to the following relevant legislation: - 1996 Land Code of the Republic of Tajikistan - 2000 water Code of the Republic of Tajikistan - 2001 Law on Land Management - 2001 Law on Environmental Protection - 2012 Law on Ecological Expertise. The full list of national laws, regulations and policies and relevant of each legislation to the project activities are detailed in Annex 4, Section-III of the project proposal (ESMF, "National Policy Framework for Environmental and Social Matters").	**Low:** Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.
Access and equity	Project activities are designed in part to support grazing control measures (rotational grazing), establish livestock exclusion zones and reforestation measures in places where degradation levels are severe, and which provide very limited benefits to linked communities. These measures will impact temporarily such communities by limiting their access to benefits from those areas,	**Mid:** Project activities could temporarily restrict availability and/or quality of, access to, resources where a land use change can displace an economic activity (as rotational grazing control, re-

	however in the mid to long term such communities are expected to benefit more. Stakeholder consultation missions carried out by UNDP project teams revealed communities are well aware of degradation levels with regards to pastures, forests and the need for improved fodder production and vegetation. Communities reportedly understand the impacts of control and restoration measures and welcome such measures to take place in their communities. To further support sustainability of given measures, the project has designed measures to reduce extensive livestock grazing through enhanced fodder production techniques (within exclusion zones, rotational grazing, on-site production, demonstration plots, etc), productive on-site animal husbandry, and establishment of watering sites at mid-stream levels of catchment/watershed areas (saving livestock energy in search of water sources in the upstream). To further inform communities of anticipated benefits, the project will carry out cost-effectiveness analysis with mid- to long-term impacts. To address short-term restrictions concerning access to pasture lands and forests, the project will promote alternative business opportunities (income generating demonstration activities) and community enterprise developments that will help communities generate compensating incomes. The project is also foreseen introduction of energy-efficient stoves into target communities to compensate for limited access to forest resources. The project will engage widely with relevant stakeholders at regional, sub-regional and community levels to agree on rotational routes for the transit of larger herds and eliminate potential disregards of implemented grazing control measures applied locally by large herd owners from other communities, districts and/or regions. Jamoat level monitoring and control mechanisms will be introduced to enforce agreed measures for elimination of land degradation and improving vegetation growth in target pasture lands, and ensure that target communities effectively benefit from project interventions. Project activities are designed to promote fair and equitable access to benefits in a manner that is inclusive. Activities will not exacerbate existing inequities, particularly with respect to marginalised or vulnerable groups. For this purpose, UNDP teams have conducted	afforestation). Potential impacts will be monitored on a regular basis through participatory representative approach to ensure access and equity is equally provided to all communities and groups.

	Stakeholder Consultation Missions (1-7 March, 11-22 June, 19-26 December 2018) with participation of development partner agencies, counterpart ministries and institutions, Kafernigan river basin authorities, women organizations, Dehlan Farms and Water Users Associations, and heads of communities. In addition, relevant Assessments have been carried out to adequately identify marginalized and vulnerable groups, vulnerable climate affected communities, vulnerable women and households, as well as consultations regarding suitable sub-projects for the given groups. The project is designed to maintain such approach with fair participation of all representative groups with particular focus on marginalized and vulnerable, during the decision making processes. The Project Steering Committee will monitor the level of participation of relevant community members in Pasture User Groups, Women Committees, River Basin Organizations, Forest Community Management groups, as well as level of fairness and access to project benefits that is equal and equitable for all target communities.	
Marginalized and vulnerable groups	Marginalized and vulnerable groups in project area of Kafernigan river basin have been generally identified (i) population groups or communities that live in areas with increased impacts of climate change. The same applies to those groups who have land plots/agricultural lands in areas potentially vulnerable to impacts of climate change. In particular, marginalized and vulnerable groups include: (ii) poor and food insecure households (households with incomes below poverty line), households with limited or no productive assets (livestock, agricultural land plots), (iii) female headed households, (iv) households with majority children and elderly members, (v) households with handicap members/individuals, and (vi) households without manpower due to relatively higher rates of labor outmigration among men (to Russian Federation and elsewhere). Often, as experience shows, such vulnerable groups have limited mobility to participate during key stages of project implementation. For this purpose, UNDP has compiled information on the abovementioned groups with support from local authorities. Reportedly, district authorities maintain regular updates of vulnerable and marginalized population. UNDP has developed a Stakeholder Engagement Plan, which will guide consultations inclusively during implementation phases, assuring broad representation	**Mid:** Vulnerable and marginalized groups may have (i) limited mobility to participate during key stages of project implementation, and (ii) limited access to entitled productive assets (ref. degraded pastures and forests). Stakeholder Engagement Plan developed by the project will guide inclusive participation of such groups in decision making processes. In cases where a land use change can temporarily displace an economic activity (as rotational grazing control, re-afforestation), in accordance with domestic laws and regulations, the project identified compensatory income generating opportunities which will be offered to vulnerable and marginalized groups. Potential impacts will be monitored to ensure such opportunities materialize.

	within existing relevant community based organizations and groups. Such organizations and groups have been consulted during stakeholder consultation missions and include farming associations and cooperatives, women's committees, intervention related initiative groups, pasture development associations, water users associations, forestry cooperatives and communal health promoters. As part of the given Stakeholder Engagement Plan the project will regularly monitor and assess the extent of involvement of marginalized and vulnerable within such organizations and groups. Community mobilization specialists appointed jointly by the UNDP and district authorities will organize focused consultations with such groups to design sub-projects tailor-made and suitable for vulnerable and marginalized households. In each of the selected project target districts of Kafernigan River Basin, UNDP jointly with District Authorities have identified communities that are located within areas vulnerable to hazardous climatic events. In addition, project will carry out localised vulnerability assessments of target communities in a participatory manner for tailor-made activities suitable to the local context. Where feasible, such groups will be prioritised for concrete adaptation interventions. The Stakeholder Engagement Plan will guide such consultations inclusively during preparation phases, assuring broad representation of existing relevant community-based organizations and groups. These involve, farming associations and cooperatives, women's committees, intervention related initiative groups, pasture development associations, Water User Associations (WUA), forestry cooperatives and communal health promoters. The project will monitor and assess the extent of involvement of vulnerable and marginalized people within such groups and associations. Targeted actions that may be prioritized and suitable for vulnerable groups include on-farm adaptation interventions, household plot productivity measures, selection of demonstration plots with farmer field school support. Certain enterprise development and income generating activities (bee keeping, fodder production, livestock productivity support, etc) are also determined to be suitable for the given groups to ensure benefits are distributed inclusively and equitably.	
Human rights	Project activities will respect and, where applicable, promote international human rights. Tajikistan is the most vulnerable country to climate change in Central	**Low:** Necessary monitoring is limited to compliance with related laws and addressing

	Asia. Negative effects of climate change on the Tajik population include glacial and permafrost melt, increased rainfall intensity and longer and more frequent dry spells. Together, these effects have increased the rate of topsoil erosion, threatening the livelihoods, health and wellbeing of the population. Losses from natural hazards currently amount to ~20% of the country's GDP and climate change impacts are predicted to increase the frequency and magnitude of such losses. In the future, loss amounts are expected to rise from ~US$50 million in 2014 to ~US$132 million by 2030. Approximately 33% of all agricultural losses in the country are currently attributable to climate change and variability. The project will support Tajikistan's authorities and target population to enhance the climate resilience amongst small-scale farmers and pastoralists of Kofirnighan River basin. Improving the climate resilience of these communities will involve developing a climate-resilient catchment management strategy to inform the planning and development of rural areas in adapting to the increasing impacts of climate change. Interventions will also promote sustainable management of natural resources through an integrated landscape approach to catchment management. The project will directly benefit an estimated 46,000 individuals who are especially vulnerable to the impacts of climate change, through the design and implementation of concrete on-the-ground EbA interventions for more efficient natural resources management. These measures will also provide social and economic benefits to target population in terms of livelihoods, health and wellbeing of the population. In terms of human rights mainstreaming, the impact is multidimensional in nature and addresses the right to food, energy, water, health, etc. In particular, the project's interventions have the following social and economic benefits for target population: (a) increased profit margins and farm income, (b) reduced loss of crops and land caused by slope instability, drought or dry spells and also caused by ineffective agricultural practices and livestock grazing/breeding; (c) reduced agricultural inputs, water consumption and thus production costs; (d) reduced risk of economic failure due to diversification of production on and off-farm; (e) reduced crops susceptibility to pests; (f) increased nutrition and food security for local communities; (g) increased provision of fuelwood and timber and reduced loss of trees to drought or dry spells;	concerns through the grievance mechanism.

	and (h) increased pasture productivity, fodder production and carrying capacity. The project is designed to ensure benefits are shared broadly in a non-discriminatory and equitable manner. All relevant stakeholders will be involved in decision-making processes and consultations, and that such participatory processes are transparent. Necessary strategies, action plans, site selection criteria and lessons learned will be documented and shared regularly through community driven consultation platforms that the project will seek to facilitate.	
Gender equity and women's empowerment	Project activities are designed so that all genders are: i) able to participate fully and equitably; ii) receive comparable social and economic benefits; and iii) do not suffer disproportionate adverse effects as per UNDP Gender Mainstreaming Strategy. Under the Land Code, women and men have equal rights to access and manage land. According to the World Bank (2011), 78% of female-headed households (where there is no working-age male) manage land, compared to 89% of male-headed households, and 91% of female-headed households with at least one working age male. Under the Family Code and the Civil Code, within registered marriages, spouses have equal property rights, but this does not apply to unregistered, religious marriages, leaving many women unable to claim their property rights when the relationship breaks down. A gender analysis has been carried out during the project development phase, which identified vulnerabilities and resilience of women groups to various impacts of climate change in KRB – with special consideration of land resource use, natural disaster risk management, water resources management, pasture and forest resources use. The given analysis will feed into regular M&E throughout project implementation, and vulnerabilities of women will be monitored against identified risk areas. The Focused Group Discussions carried out with women groups during project development phase (December 2018) have identified suitable EbA activities most beneficial to women, and therefore special emphasis will be placed on these activities whilst design of sub-projects during preparatory phases of project implementation. The project anticipates that at least 50% of beneficiaries will be women. The stakeholder participation mechanisms for sub-project formulation and	**Mid:** Vulnerable women may not be adequately represented in decision-making or participation in the design and implementation of the sub-projects. As a result, they may have limited access to resources, opportunities and benefits. Women's engagement and participatory mechanisms will be put in place. Dedicated gender focal points will be assigned both at project level and in each target community to proactively identify particularly vulnerable women, including those with restricted mobility and other conditions. Such proactive inclusion approaches will ensure that the project addresses women's adaptive needs . As part of the project M&E system systematic monitoring will be undertaken to ensure women's participation, involvement and empowerment.

	implementation include provisions to ensure that women are able to represent their interests effectively, and the social impact indicators and corresponding targets of the project will be gender-sensitive, ensuring that women receive an equitable share of benefits and that their status and interests are not marginalized. For monitoring, disaggregated and measurable data related to gender equality and empowerment of women will be incorporated. Furthermore, when possible, measures and techniques that that can have a positive impact by closing the gap of inequality between men and women will be promoted.	
Core labour rights	The Republic of Tajikistan has ratified 8 fundamental ILO conventions. The country has a comprehensive legislation to protect labour rights in aspects as forced labour (C029), freedom of association and protection of the right to organize (C087), right to organize and collective bargaining (C098), equal remuneration (C100), abolition of forced labour (C105), discrimination (employment and occupation) (C111), minimum age (C138), and worst forms of child labour (C182). The Project will be implemented in compliance with legislation including the Labour Code (2016). National and regional stakeholders were involved during the design stage of the project to ensure core labour rights have been respected and considered. Compliance with all labour rights will be ensured in all project activities through the involvement of labour officers in target villages. Component 2 will involve labour for the implementation of EbA interventions, where community members will provide the labour. All of the labour involved will be on daily wages where the wages will be determined according to tasks. Wage rate will be calculated on the basis of prevailing minimum wage rate for the assigned task. The record of work done for labour engaged will have to be maintained and the wages paid accordingly. Hours of work and the timing of the hours will be determined in consultation with the labour provided and the prevailing practices in the area. Positive discrimination in favour of women may be used to provide fair and equal opportunity to women to seek employment as labour. All forms of negative discrimination in respect of employment and occupation will be eliminated. The project will not engage in child labour in any of its activities or interventions. All forms of forced or compulsory labour will be eliminated.	**Low:** Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.

	Under Component 2, local community members may be exposed to the risk of accidents while implementing EbA interventions. In addition, there is a low risk of child labour outside the limits of the law.	
Indigenous populations	Kafernigan river basin (target area for project implementation) does not have any indigenous populations.	N/A
Involuntary resettlements	The project will not cause any involuntary resettlement of communities. However, sub-projects targeted at pasture grazing control measures, re-forestation, and agricultural demonstration land plots may involve displacement of economic assets (pasture lands, agricultural lands, forests). To eliminate or minimize any possible harm to potential incomes, the project will target severely degraded lands (pastures, forests) which are feasibly compensable with alternative income-generating activities targeted to affected communities or groups. Sub-projects in such areas will be implemented only if compensatory income generating opportunities are offered and agreed with respective users (target communities). The Consolidated Stakeholder Consultations and Missions Report provided in Annex 1 of the proposal indicates preliminary list of income generating activities that can be offered as compensation to affected communities. Moreover, the Proposal also includes cost-benefit analysis (Table 9, Annex 9) for proposed community level interventions that will be used to accurately estimate compensating measurements. Such analysis will further be upgraded in the course of project implementation.	**Low:** Physical resettlements are not necessary for the activities, however, temporary economic displacement (agricultural lands, pastures, forests) are possible due to planned grazing control measures, reforestation activities and introduction of agricultural demonstration plots. Sub-projects will be implemented in such areas where displacement of economic assets is both temporary (short-term) and voluntary. Necessary monitoring will include compliance with related laws, human rights, international provisions and grievance mechanism.
Protection of natural habitats	By implementing EbA activities, the project promotes the improved management of natural landscapes. The project is therefore likely to result in the improved protection of natural habitats rather than having any negative effect. Moreover, the project will consult and involve responsible officers and community representatives at district and village level to ensure this principle is adhered. Project activities under Component 2 will be carried out on areas already under usage. The preliminary assessments ("Land Use and Climate Change: restoration of forests and pastures in KRB") have	**Low:** Project activities will be carried out on areas already under usage, but there is low risk that the construction of EbA interventions could result in the destruction of small areas of natural habitat. Natural habitats are determined and defined by the Government of Tajikistan (Committee for Environmental Protection), and UNDP will monitor project interventions

	revealed vulnerable communities vulnerable to climate change, and with severely affected pastures, forests and vegetation, which will be considered as target for project implementation. Among such areas no natural habitats are discovered (in or near). Despite this focus on improving ecosystem goods and services, there is a low risk that the construction of EbA interventions could result in the destruction of small areas of natural habitat.	and mitigating measures will be taken in case any sub-projects are selected to be implemented within or relative proximity to such defined natural habitats.
Conservation of biological diversity	The Project will be supporting activities in environmentally sensitive areas, but this work will aim at reducing impacts in these areas with a net positive impacts. Project activities will be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species. The project promotes the rehabilitation/restoration of abandoned and overexploited forests and degraded forest ecosystems, as well as reforestation of areas adversely affected by extreme climate events. The use of native and climate-resilient varieties will be promoted, but alien species may be introduced if necessary. Certain alien species may be used for complementary planting (climate-resilient crops seed varieties) in areas being reforested to increase biological biodiversity and enhance climate resilience. Prior to such introduction, relevant experts at the Committee for Environmental Protection (CEP) and among development partner agencies will be consulted on successful examples across the regions. National environmental norms, standards and procedures for the introduction of alien species will be followed and monitored in each case.	**Low:** There is a risk that alien and/or invasive alien species are used in reforestation activities. Prior to selection of suitable species, the project Team jointly with Ministry of Agriculture and Forestry Agency will fact check applicability against endorsed inventory of species proven harmless for Kafernigan River Basin. Joint monitoring of flora and fauna changes will also be carried out. The Project will also support the setting up of a procedure for tracking, monitoring and registration of restoration actions implemented. During the last year of the project an ecological and land use assessment will be carried out to evaluate the rate of success of the restoration.
Climate change	Project activities will not result in any significant or unjustified increase in GHG emissions or other drivers of climate change. The project's designed activities directly support implementation of ecosystem-based adaptation, including climate-smart agriculture and sustainable land management in agro-ecological landscapes. Such actions include rehabilitation and restoration of degraded forest ecosystems, vegetation growth support, water retention measures, establishing saxaul plantations, climate-resilient crop seed planting, and others to prevent and mitigate water related adverse	**Low:** Climate change adaptation of communities will be included in M&E. GHG emissions risk will be monitored and managed. Compliance with related laws will be monitored and concerns through the grievance mechanism addressed in accordance with respective laws and regulations.

	climatic events that have typically posed risks to livelihoods and health of target communities. Current and predicted climatic variability has been taken into account during project design. Throughout the inception and implementation phase, any changes in the climate will be taken into account in planning for the implementation of EbA activities. Drought- and flood-resilient species will be used, as well as indigenous species wherever possible. Techniques to assist plant growth particularly in the seedling/sapling phases and to reduce risk of damage from extreme climate events will be used. Species will be planted in appropriate seasons to reduce risk of hazard impact. The project also aims to build climate resilience through development of a catchment management strategy to manage and operationalize climate risks at district and Jamoat levels in Kafernigan river basin. The project will develop multi-hazard climate risk models (MHCRM) for vulnerable watersheds in KRB and provide technical support for the modernization of automated weather stations in the most vulnerable districts of KRB. These will help authorities and communities adequately assess risks, climate related projections and incorporate these risks in the Kafernigan River Basin Management Plans to make informed decisions on EbA activities.	
Pollution prevention and resource efficiency	Project interventions are not expected to produce any significant amounts of waste or other pollutants. The Project will support communities to adopt improved farming techniques, such as organic agriculture, soil and water conservation, more resilient crop varieties, that would reduce the use of fertilizers and pesticides. Although biological pest control will be preferred, potentially harmful pesticides may be needed for specific use. In this particular case, they will be properly managed, stored, and used in accordance with national and international standards, regulations and procedures.	**Low:** Pest control measures and agricultural support may involve potential use of pesticides. Selection and use of suitable pesticides chosen for application will be consulted with the Ministry of Agriculture. Compliance with available Pest Management regulations and manuals endorsed by the Ministry of Agriculture will be duly monitored.
Public health	The EbA measures may involve small-scale construction of water saving irrigation systems, rain water harvesting systems in water-scarce zones, rehabilitation of irrigation, draining and pumping systems and on-farm water resources management. The Project will follow related environmental impact assessment procedures and ensure compliance with national construction standards and norms, sanitary norms and regulations, and other national laws and	**Low:** Small-scale construction activities (Component 2) may pose safety risks to community members. Regular monitoring will be conducted for compliance with national construction norms and standards, as well as WHO guidelines on Water Safety Plans (drinking water and sanitation).

	regulations (forestry, water, environment, and health). Most relevant technical norms and standards include: - Construction norms and standards on hydro-technical facilities: (SNIP) 33-01-2003; - Construction norms and standards on irrigation systems and facilities: (SNIP) 3.07.03-85; - Construction norms and standards on foundations of hydraulic engineering structures (SNIP) 2.02.02-85; - Construction norms and standards on trunk pipelines (SNIP) 2.05.06-85; - Construction norms and standards on technological equipment and technological pipelines (SNIP) 3.05.05-84. The project will also follow technical guidance and best practices regarding rain-water harvesting systems, drip-irrigation techniques, and micro-reservoirs that are not adequately institutionalized across the country. Other activities may include construction of gabions, terracing, bank enforcement and small dams, the project will assess best practices and lessons learned to address community safety risks from such construction. With regards to safe drinking water supply and sanitation, UNDP will implement and promote knowledge about requirements of adopted guidelines of WHO on Water Safety Plan Approach.	
Physical and cultural heritage	No adverse impacts are foreseen on physical and cultural heritage of the people in target communities and areas. Project activities are designed through a participatory and consultative approach and with support of key government institutions (i.e. Committee for Environmental Protection, Ministry of Agriculture, Forestry Agency. Chances to damage any physical assets are practically negligent.	**Low:** Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.
Lands and soil conservation	The project, by design, promotes the conservation of soil and land resources. Specifically, through the implementation of EbA activities in Component 2 – including agroforestry – soil stability will be increased, the runoff of nutrients from topsoil will be reduced, and the fertility of soil at target sites will be increased. An integrated catchment management strategy will be developed for the KRB which will be operationalised at district, Jamoat and village levels. The strategy will provide detailed guidelines for suitable landscape management interventions to reduce the vulnerability to climate change.	**Low:** Necessary monitoring is limited to compliance with related laws and addressing concerns through the grievance mechanism.

	These interventions are designed to comply with the principles of sustainable land management (SLM) and climate-smart agriculture (CSA) wherever applicable. The training will be targeted at all levels (district, Jamoat, village). In so doing, the project will enhance support services to villages and enable participatory, local-level planning. The lessons learned from the project will enable a policy and investment framework to be developed for replicating and scaling up EbA interventions across the country. Existing knowledge management platforms and hubs will be used for promoting this replication and upscaling.	

Based on the findings presented above, the proposed project activities are unlikely to result in significant negative social and environmental impacts. The Project is ranked as **Category B (Moderate)** across all components. The project does not foresee any high risk impacts against the environmental and social principles, and potential adverse impacts are less widespread, reversible and easily mitigated. Most impacts are likely to occur during the construction phase of EbA interventions. These impacts are likely to be minor and without long-term adverse effects.

The AF ESMF and SESP Report will serve to guide all aspects of project implementation. It will be the responsibility of the PSC to ensure that the appropriate risk mitigation measures are implemented during project implementation. Other actions that contribute to reduce risks are detailed in the ESMF (*Annex 4: Environmental and Social Management Framework)*.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Implementation arrangements

Implementing entity

The Committee for Environmental Protection (CEP) under the Government of the Republic of Tajikistan is the government institution responsible for the implementation of the project and will act as the Executing Agency (EA). The Ministry of Agriculture, Ministry of Energy and Water Resources, Agency for Land Reclamation and Irrigation along with other relevant national entities will act as project partners and will become part of Project Steering Committee.

The Committee for Environmental Protection will be responsible for executing this five-year project with the support of the UNDP under UNDP's National Implementation Modality (NIM). At the request of the Government of Tajikistan, UNDP is the Multilateral Implementing Entity (MIE). The project is nationally implemented (NIM), in line with the Standard Basic Assistance Agreement (SBAA, 1993) and the UN Development Assistance Framework (UNDAF) 2016-2020 between the UN and the Government of Tajikistan, as well as Country Programme Document 2016-2020 between UNDP and the Government of Tajikistan.

As a Multilateral Implementing Entity, UNDP is responsible for providing a number of key general management and specialized technical support services. These services are provided through UNDP's global network of country, regional and headquarters offices and units and include assistance in: project formulation and appraisal; determination of execution modality and local capacity assessment; briefing and de-briefing of staff and consultants; general oversight and monitoring, including participation in reviews; receipt, allocation and reporting to the donor of financial resources; thematic and technical backstopping; provision of systems, IT infrastructure, branding, and knowledge transfer; research and development; participation in policy negotiations; policy advisory

services; programme identification and development; identifying, accessing, combining and sequencing financing; troubleshooting; identification and consolidation of learning; and training and capacity building.

As outlined in UNDP's application to the Adaptation Fund Board for accreditation as a Multilateral Implementing Entity, UNDP employs a number of execution modalities determined on country demand, the specificities of an intervention, and a country context. Under the national execution modality proposed, UNDP selects a government entity as the Executing Entity based on relevant capacity assessments performed by UNDP. Please note that UNDP uses slightly different terminology to that used by the operational policies and guidelines of the Adaptation Fund. In UNDP terminology, the "executing entity" is referred to as the "Implementing Partner" in countries which have adopted harmonized operational modalities and the "Executing Entity" in countries which have not yet done so. The Executing Entity is the institutional entity entrusted with and fully accountable to UNDP for successfully managing and delivering project outputs. It is responsible to UNDP for activities including: the preparation and implementation of work plans and annual audit plans; preparation and operation of budgets and budget revisions; disbursement and administration of funds; recruitment of national and international consultants and personnel; financial and progress reporting; and monitoring and evaluation. As stated above, however, UNDP retains ultimate accountability for the effective implementation of the project.

The CEP will assume responsibility for the implementation, and the timely and verifiable attainment of project objectives and outcomes. It will provide support to the management unit, and inputs for, the implementation of all activities. The CEP will nominate a high-level official who will serve as the National Project Director (NPD) for project implementation. The NPD will chair the Project Steering Committee and be responsible for providing government oversight and guidance to the implementation. The NPD will not be paid from project funds but will represent a Government in kind contribution.

UNDP has the technical and administrative capacity to support the Committee for Environmental Protection and assume the responsibility for mobilising and effectively applying the required inputs to reach the expected outputs.

The financial arrangements and procedures for the project are governed by the UNDP rules and regulations for National Implementation Modality (NIM). All procurement and financial transactions will be governed by applicable UNDP regulations under NIM.

UNDP Direct Project Services as requested by Government: The UNDP, as the Multilateral Implementing Entity for this project, will provide project management cycle services for the project as defined by the Adaptation Fund Board. In addition, the Government of Tajikistan may request UNDP direct services for specific projects, according to its policies and convenience. If requested the services would follow the UNDP policies on the recovery of direct costs. These services (and their costs) are specified in the Letter of Agreement (Annex 7). As is determined by the AF Board requirements, these service costs will be assigned as Project Management Cost, duly identified in the project budget as Direct Project Costs.

Comparative advantage

UNDP's comparative advantage in supporting the implementation of development programmes in Tajikistan is its presence both at the policy and operational levels. This set-up enables UNDP to obtain and use the evidence from the ground to influence policy formulation and discussions. Because of the specific nature of most development projects requiring physical presence on the ground, additional comparative advantages of UNDP include, but are not limited to, its: i) physical presence on the ground; and ii) continuous partnerships maintained with the development actors, local authorities and beneficiary communities. Because of this on-the-ground presence and experience with work in different sectors and communities – including the water sector – UNDP is in a prime position to be the IE for the proposed project.

Presence on the ground

UNDP has five Area Offices (Figure 8) located in:

- Gharm in the north-east of Rasht Valley;
- Khujand and Ayni in the north of Soughd Region; and
- Kulyab to the south-east and Shaartuz to the south-west of Khatlon Region.

Kulyab and Shaartuz Area Offices cover all districts of Khatlon Region, including the eight districts bordering Afghanistan, namely Qumsangir, Kabodiyon, Jilikul, Shaartuz, Pyanj, Farkhor, Hamadoni and Shurobod. Figure 15 illustrates the regions covered by each Area Office.

Through these offices, UNDP has implemented over 100 community development, poverty alleviation, disaster risk reduction, energy and environment, conflict management and other development programmes and projects totalling US$52 million. These programmes and projects have benefited over 3,000,000 people living in 46 rural districts, which is ~1,228 rural Tajik communities.

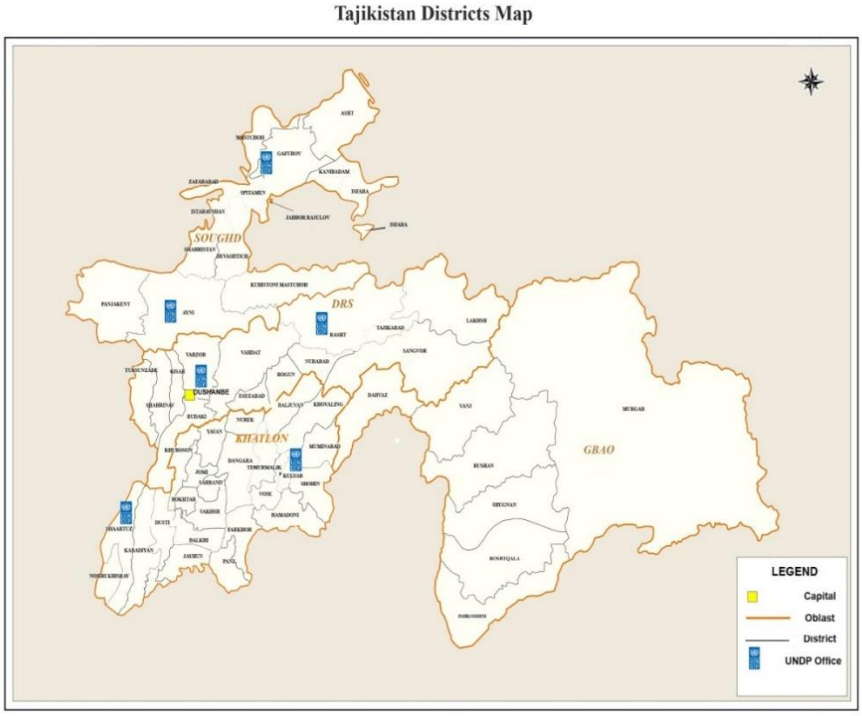

Figure 8. Map of Tajikistan indicating the six UNDP Area Offices.

Experience in the water sector

UNDP and the GoT have effectively collaborated in the past and because of this, GoT has considerable trust in UNDP's capability. This enables UNDP to facilitate the formation and convening of high-level policy dialogue. As a UN coordinating agency, UNDP is also able to ensure synergies and has access to resources from other UN system agencies, including FAO, UNECE and UN-Water.

UNDP's leadership in and support for the water sector over recent years has grown, presently focusing on policy and governance with pilot interventions in the Ferghana Valley[291]. UNDP's support to the Water Sector Reforms Programme of the Republic of Tajikistan for 2016–2025 (Water Reform Programme)[292] is evident through the implementation of several projects:

- EU-funded project titled, 'Promoting integrated water resources management and fostering transboundary dialogue in Central Asia';
- UNDP-funded project titled, 'Enabling activities to promote the national consultations on post-Rio agenda and demonstrate IWRM approaches in Tajikistan';

[291] particularly with the Isfara Transboundary River Basin
[292] Water Reform Programme 2015.

- UNDP/Bureau for Crisis Prevention and Recovery (BCPR) project titled, 'Strengthening conflict management capacities (including transparent resource allocation and sound water management principles) for dialogue in conflict-prone areas of Tajikistan';
- Eurasian Development Bank (EDB) project titled, 'Feasibility study to construct and operate small hydro-power stations on irrigation facilities in Tajikistan', Phases I and II;
- Swiss Development Cooperation (SDC) funded project titled, 'Tajikistan Water Supply and Sanitation'; and
- Swedish International Development Cooperation Agency (SIDA) project funded through the Stockholm International Water Institute (SIWI) titled, 'Applying human rights-based approach to water governance in Tajikistan'.

The above projects were included under the umbrella of Integrated Water Resources Management (IWRM) which is a central principle of the GoT-adopted Water Reform Programme. In doing so, UNDP adopted a strategic approach of linking policy work at the national level with practice in the field, ensuring top-down and bottom-up feedback informing both policy-makers and practitioners on effective mechanisms for reform implementation. The UNDP IWRM programming is principally aimed at developing and implementing national IWRM and water efficiency strategies at national and basin level. Because of this, the intervention strategy is supported by both IWRM governance and institutional reform, as well as concrete projects implemented to improve: i) irrigated agriculture; ii) rural water supply and sanitation; and iii) small-scale hydropower service delivery. At the regional level, UNDP contributes to transboundary trust building and conflict prevention through strengthening water cooperation mechanisms in the Fergana Valley.

UNDP has been involved in most policy initiatives for the water sector. Involvement at the national level was aimed towards developing an enabling environment for coordination and establishing a unified approach to policy development. This involvement has resulted in a harmonised reform process towards developing improved water cooperation and conflict mitigation at a regional level. A list of UNDP's actions, roles and responsibilities under the umbrella of IWRM programming is included below.

- UNDP played an active role in elaborating policy proposals for water sector reform, specifically providing designs to principal resolution and introducing IWRM principles into the Water Code[293].
- The development of an analytical review, titled 'Current conditions and perspectives on integrated water resources management in the RT', provided reflections on existing challenges and recommendations in the water resource management field. This review described the legal, institutional, technical and financial (economic) aspects of IWRM as well as detailed perspectives for the country's transition to basin management approach.
- UNDP supported GoT institutions in improving the legal and institutional framework for the country, developing by-laws and implementation mechanisms for the Water Code[294] and the Law on Drinking Water[295].
- UNDP was responsible for facilitating the establishment and support of the Inter-Ministerial Coordination Group (IMCG) on drinking water supply[296]. The IMCG was primarily formed to assist in design and implementation of the state policy on development of the drinking water and water supply sector.
- Because of UNDPs support to the IMCC, significant progress was made on policy proposals and implementation mechanisms for the drinking water and supply sector. The following issues were focused on through UNDPs support:
    - practising ownership and operational management rights;
    - modelling institutional structures at the district and sub-district levels;
    - simplifying procedures for obtaining permits for project implementation;
    - modelling effective tariff scheme and scheme implementation; and
    - improving governance, transparency, accountability and consumer participation in water systems management.

[293] Water Code 2001.
[294] Ibid.
[295] Law of the Republic of Tajikistan on Drinking Water and Water Supply (Law on Drinking Water). 2010. Government of Tajikistan, Dushanbe.
[296] Swiss Agency for Development and Cooperation (SDC). 2012. The Fourth Meeting of the Inter-Ministerial Coordination Council on drinking water supply discussed realization of human right to water and sanitation in Tajikistan (IMCC). SDC, UNDP and Oxfam.

- UNDP's contribution to transboundary water cooperation has been significant over recent years. Specifically, UNDP assisted with improving water management in the transboundary basin of Syr Darya in the Fergana Valley[297]. This programme benefited border communities of Tajikistan and Kyrgyzstan. UNDP conducted a review, titled 'Consolidated review of water resources management in transboundary Isfara River Basin', for both countries to identify main barriers to water distribution. The review identified the challenges for overcoming the barriers to water distribution between border communities. In addition, the review included recommendations for efficient water management, conflict management and the development of proposals for further interventions to improve transboundary water cooperation between the two countries.
- UNDP has also undertaken a series of ground-level interventions to implement specific elements of the IWRM approach. The range of these interventions are listed below.
    - Rehabilitation of hydrological posts in Matpari, Tangi, Vorukh and Rabot to ensure more accurate and transparent record of hydrological events. The rehabilitation process also included monitoring water resource flows in the Isfara River Basin. Results of this monitoring had an effect on fair regional water distribution between Kyrgyzstan and Tajikistan at both upstream and midstream levels, and between Tajikistan and Uzbekistan at the downstream level.
    - Rehabilitation of water supply facilities project, titled 'Inter-state irrigation canal 'Druzhba' and drinking water supply system in cross-border Chorku Jamoat'. The rehabilitation was accompanied by the application of good governance and sound water management principles. These principles highlighted the importance of transparency for water distribution as a main criterion for sustainability.
    - Providing support for water management through a project titled 'Support to inter-stream water cooperation in Isfara River Basin'. The outcomes of this project ensured sound water management and distribution at the basin level among farming communities at upstream, midstream and downstream levels. This resulted in the reducing the risk of conflicts over resource distribution. Reducing water demand through a demand-driven approach at all stream levels by providing improved maintenance of irrigation canals and management support based on transparency and participation have been central in achieving this result. This is being implemented by providing significant support to previously established Water User Associations and their federation in Isfara River Basin.

Project Steering Committee (PSC) will be convened by CEP and will serve as the project's coordination and decision-making body. The PSC meetings will be chaired by the NPD. It will meet according to necessity, but not less than once in 6 months, to review progress, approve work plans and approve major deliverables. The PSC is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined. The PSC's role will include: (i) overseeing project implementation; (ii) approving all work plans and budgets, at the proposal of the Project Manager (PM), for submission to Istanbul Regional Hub; (iii) approving any major changes in plans or programmes; (iv) providing technical input and advice; (v) arbitrating any conflicts within the project and/or negotiating solutions between the project and any other stakeholders and (vi) overall evaluation.

Project Assurance: UNDP Tajikistan will support project implementation by assisting in monitoring project budgets and expenditures, recruiting and contracting project personnel and consultant services, subcontracting and procuring equipment. UNDP Tajikistan will also monitor the project implementation and achievement of the project outcomes/outputs and ensure the efficient use of donor funds through an assigned UNDP Team Leader. UNDP will act as the Senior Supplier and Project Assurance. In this role, UNDP will also monitor project performance in relation to UNDP's Social and Environmental Safeguards Policy (SESP) as well as the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

National Project Director (NPD): The NPD will be a member of CEP, assigned to the project for its period of duration. The NPD's prime responsibility is to ensure that the project produces the results specified in the project document to the required standard of quality and within the specified constraints of time and cost.

Mechanisms for local participation: the project will use the existing locally established mechanisms for local consultation and participation.

An organogram of the project organisation structure is illustrated in Figure 9.

[297] Soughd Region, Isfara River Basin

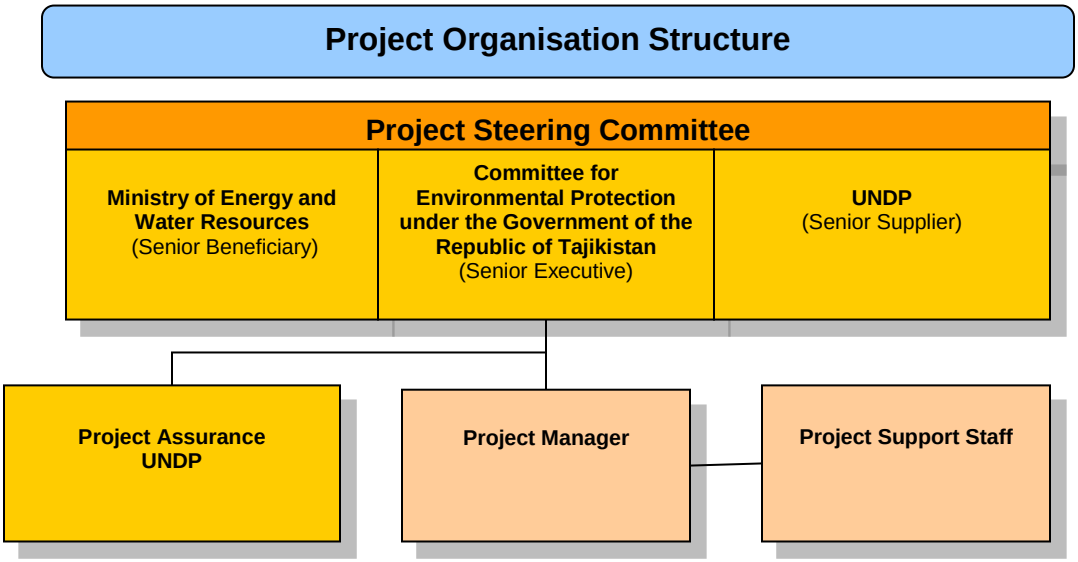

Figure 9. Organogram of project organisation structure.

A specially formed **Project Steering Committee** (PSC) will be responsible for the implementation of the project. The PSC will include representative of UNDP in Tajikistan, as well as representatives from relevant stakeholders including CEP and MEWR. In addition, the PSC will be responsible for ensuring the effective coordination of this project with other relevant initiatives in Tajikistan.

In addition, consultative committees will be formed, consisting of representatives from local government in the project areas, community representatives, and individuals with technical expertise. The consultative committees will provide technical guidance and feedback to the PSC.

The day-to-day administration will be carried out by a Project Manager (PM), Project Analyst (PA), Admin. Finance Assistant (AFA), and Project Assistant (PA), who will be located at UNDP premises. As per Government requests, the staff will be recruited using standard UNDP recruitment procedures. The PM will, with the support of the AFA and PA, manage the implementation of all activities, including: preparation/updates of work and budget plans, record keeping, accounting and reporting; drafting of terms of reference, technical specifications and other documents as necessary; identification, proposal of consultants, coordination and supervision of consultants and suppliers; organization of duty travel, seminars, public outreach activities and other events; and maintaining working contacts with partners at the central and local levels. The Project Manager will liaise and work closely with all partner institutions to link the project with complementary national programmes and initiatives.

The PM is accountable to UNDP for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. The PM will produce Annual Work and Procurement Plans (AWP&PP) The PM will further produce quarterly operational reports and Project Performance Reports (PPR). These reports will summarize the progress made versus the expected results, explain any significant variances, detail the necessary adjustments and be the main reporting mechanism for monitoring activities. The PM will be technically supported by contracted national and international service providers, based on need as determined by the PM and approved by the PSC, as needed. Recruitment of specialist services will be done by the PM, in accordance with UNDP's rules and regulations.

B. Financial risk management

Financial and project management has been conducted according to UNDP's Programme and Operations Policies and Procedures to ensure that financial and project risks are mitigated against. Detailed financial and project risks as well as the associated mitigation strategies identified have been outlined in Table 13.

Table 13. Financial and project risk management measures for the proposed project, including risk ratings.

Risk no.	Identified risk	Risk rating	Mitigation measure
1.	Disagreement amongst stakeholders regarding demonstration of site selection.	Low	• Intervention sites will be selected using an agreed upon list of criteria and the developed shortlist of EbA interventions to ensure the selection is transparent and equitable. • There will be a participatory approach to project activities, particularly with intervention site selection.
2.	High turnover of staff members in executing and implementing agencies may negatively impact on project deliverables.	Low–medium	• Proposed project will build partnerships between government and non-government agencies to ensure continuity.
3.	Loss of government support may result in lack of prioritisation of proposed project activities.	Low	• Regular stakeholder consultation and involvement will be undertaken to ensure that government maintains its commitment and considers the project as a support mechanism to its existing climate change adaptation programmes.
4.	Institutional capacities and relationships are not sufficient to provide effective solutions to climate problems that are complex and multi-sectoral.	Medium	• The project design has a focus on building institutional capacity. This will ultimately lead to the development of an appropriate institutional framework for analysing climate change impacts on the management of *inter alia* water, land use, natural resources and pastures.
5.	Capacity constraints of local institutions may limit the ability to undertake the interventions implementation.	Medium	• Human resource capacity will be developed in all targeted regions and villages. • Collaboration and exchange between local institutions and regional/international research institutes will be initiated. • An Integrated Catchment Management Specialist will work closely with the Programme Manager to ensure timely delivery of project outputs.
6.	Priority interventions implemented are not found to be cost-effective.	Low	• Cost-effectiveness is a core principle in the implementation of adaptation measures. Detailed information will be recorded regarding cost-effectiveness. This will be disseminated through the knowledge centres supported by the project and will be of use to future adaptation initiatives for the Kofirnighan River Basin and Tajikistan as a whole. • Interventions to be selected for the EbA shortlist will be chosen based on their previous success and results in the country.
7.	Lack of commitment/buy-in from local communities may result in failure of intervention sites.	Medium	• A stakeholder engagement plan will be developed during the inception phase. • Community stakeholders will continue to be consulted with throughout the project inception and implementation phase.
8.	Current and predicted climate variability and/or extreme climate events result in poor results for EbA interventions.	Medium	• Current and predicted climatic variability has been taken into account in project design. Throughout the inception and implementation phase, any changes in the climate will be considered in planning for the implementation of EbA activities. • Drought- and flood-resilient species will be used, as well as indigenous species wherever possible. • Techniques to assist plant growth particularly in the seedling/sapling phases and to reduce risk of damage from extreme climate events will be used. • Species will be planted in appropriate seasons to reduce risk of hazard impact. • Ensuring diversity in selected seeds and crops will reduce this risk.
9.	Trees and other species planted by the project are cut down by the communities for fuelwood.	Medium	• Community involvement and awareness raising will be undertaken to avoid this risk. • Species chosen for planting will be beneficial as fruiting trees rather than as fuelwood.

C. Environmental and social risk management

As outlined in Part II: K on the environmental and social principles included in project design, the proposed project activities are unlikely to result in significant negative social and environmental impacts. Most impacts are likely to occur during the construction phase of EbA interventions. These impacts are likely to be minor and without long-term adverse effects.

Despite the positive impacts that project activities will bring into effect for communities and ecosystems within the KRB, some environmental and social risks could be triggered according to the AF E&S and the UNDP SESP. An evaluation of the project against each of the AF principles was conducted in preparation of the SESP Report and is illustrated in Table 12 under Part II: K[298].

The SESP Report will serve to guide all aspects of project implementation. It will be the responsibility of the PSC to ensure that the appropriate risk mitigation measures are implemented during project implementation. Based on the results of the SESP, risk mitigation strategies for the relevant AF E&S Principles have been developed. These are detailed below. For details on the grievance mechanism outlined for the project, refer to Annex 4.

Principle 1. Compliance with the Law.
During the development of the Full Proposal, all relevant stakeholders were consulted to ensure that the all legal requirements were met. The project is therefore well-aligned and complies with national and sub-national policies, laws, plans and priorities for sustainable development and climate change adaptation in the KRB. See Part II: D and E for a full description of this alignment and compliance.

Principle 2. Access and Equity.
To ensure full implementation and adherence to this principle, project activities are designed to provide equal and accessible benefits to communities in the most vulnerable areas of the KRB. The identification of vulnerable districts was done through a fair and transparent process using the ongoing studies and assessments being conducted across the country as well as in the KRB.

During the implementation of EbA interventions under Component 2, local government authorities at each selected site will ensure that all project activities will not reduce or prevent communities from accessing basic rights. These rights include health services, clean water and sanitation, energy, education, housing, safe and decent working conditions and land rights. All community institutions and individuals will be sensitised towards the approach of prioritising support to most vulnerable communities while ensuring benefits reach further communities. This will mitigate any inter-community conflicts that might arise as a result of focusing on the most vulnerable villages.

Principle 3. Marginalised and Vulnerable Groups.
To avoid social exclusion of marginalised communities, orientation/sensitisation will be conducted at both the *jamoat* and village level to ensure equal participation within project activities. Additional social impacts that may be realised will therefore not unjustly impact on marginalised and vulnerable groups.

However, a small risk remains that vulnerable and marginalised groups will have insufficient access to project activities, particularly the climate-smart agricultural techniques and EbA interventions under Component 2.

Principle 4. Human Rights.
Project preparation and implementation phases will follow a human-rights based approach. No activities are included in project design that are not in line with established international human rights. Moreover, the project will promote the basic human rights of access to food, water and information.

The project seeks to ensure that benefits of all activities are shared broadly in a non-discriminatory, equitable manner through participatory processes and transparent selection criteria. Extensive stakeholder consultations

[298] Part II: K includes a checklist for environmental and social principles for project design.

were held during project preparation[299]. These consultations will continue throughout project implementation. Potential project-related concerns and/or grievances of local communities will be addressed through a grievance mechanism[300].

Principle 5. Gender Equality and Women's Empowerment.
The project recognises the importance of gender equality, particularly equal rights, responsibilities, opportunities and access of women and youth in the climate change adaptation. Project activities include 50% proportionate gender consideration in all project interventions, with a specific focus on on-the-ground activities under Component 2. Therefore, the project is designed to promote gender equity.

Gender equality and women empowerment civil society organisations will be involved to support the project. This will ensure adherence of all project activities to the gender equality and women empowerment. Despite the inclusion of gender considerations in the design of the project, there remains the low risk that project interventions will not benefit men and women equally.

Principle 6. Core Labour Rights.
The Government of Tajikistan (GoT) has ratified the eight core International Labour Organisation (ILO) Conventions. National and regional stakeholders were involved during the design stage of the project to ensure core labour rights have been respected and considered during the design stage. Compliance with all labour rights will be ensured in all project activities through the involvement of labour officers in target villages.

Component 2 will involve labour for the implementation of EbA interventions, where community members will provide the labour. All of the labour involved will be on daily wages where the wages will be determined according to tasks. Wage rate will be calculated on the basis of prevailing minimum wage rate for the assigned task. The record of work done for labour engaged will have to be maintained and the wages paid accordingly. Hours of work and the timing of the hours will be determined in consultation with the labour provided and the prevailing practices in the area.

Positive discrimination in favour of women may be used to provide fair and equal opportunity to women to seek employment as labour. All forms of negative discrimination in respect of employment and occupation will be eliminated. The project will not engage in child labour in any of its activities or interventions. All forms of forced or compulsory labour will be eliminated.

Under Component 2, local community members may be exposed to the risk of accidents while implementing EbA interventions. In addition, there is a low risk of child labour outside the limits of the law.

Principle 7. Indigenous Peoples.
There risks of inequitable access of indigenous peoples to the project's resources are not foreseen at this stage of project proposal. Project activities have been designed in accordance with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples. In addition, activities are aligned with all other applicable national and international instruments relating to indigenous people in Tajikistan.

Principle 9. Protection of Natural Habitats.
By implementing EbA activities, the project promotes the improved management of natural landscapes. The project is therefore likely to result in the improved protection of natural habitats rather than having any negative effect. Moreover, the project will consult and involve responsible officers and community representatives at district and village level to ensure this principle is adhered.

Despite this focus on improving ecosystem goods and services, there is a low risk that the construction of EbA interventions could result in the destruction of small areas of natural habitat.

Principle 10. Conservation of Biological Diversity.

[299] See Annex 1 for a consolidated mission and stakeholder consultation report.
[300] See Annex 5 which details the grievance mechanism outlined for the project.

By implementing EbA activities, the project promotes the improved management of natural habitats. Therefore, the project is likely to result in the improved protection of natural habitats and biodiversity.

Despite this focus on improving ecosystem goods and services, there is a low risk that the construction of EbA interventions could result in negative impacts on biodiversity.

Principle 11. Climate Change.
The project will contribute to climate change adaptation efforts in Tajikistan. Through Component 2, the project is designed to improve the delivery of climate information to all government-level decision-makers. Through this improved delivery of information and the enhanced governance coordination included under Component 1, the project addresses climate change adaptation planning.

The project is designed to: i) transfer technology to promote climate change adaptation to local communities to reduce their vulnerability to climate change; and ii) promote the development of innovative, community-based projects to increase resilience to climate change. Therefore, the project will enhance the local-level capacity of local communities to adapt to climate change. The project's climate change interventions focus on EbA activities and none of these interventions are likely to result in an increase in greenhouse gas emissions.

Principle 12. Pollution prevention and Resource Efficiency.
The project will not require (during or after implementation) significant amounts of water, energy, materials or other natural resources. It is also highly unlikely that project activities will result in the production of significant quantities of wastes, especially of hazardous or toxic wastes. The project will not produce significant volumes of effluents or air pollutants, including greenhouse gases. All applicable international standards will be met for maximising material resource use and minimising the production of wastes and the release of pollutants.

Principle 13. Public Health.
None of the project activities are envisioned to impact negatively on public health. Instead, the project will have positive impacts on health. In particular, through activities in Component 2, reduced nutrient runoff into KRB rivers and its tributaries will increase water quality and improve public health.

Principle 14. Physical and Cultural Heritage.
The EbA interventions to be implemented by the project are relatively small-scale and unlikely to result in the alteration, damage or removal of any physical or cultural heritage.

Principle 15. Lands and Soil Conservation.
The project will promote the conservation of soil and land resources. Specifically, through the implementation of EbA activities in Component 2 – including agroforestry – soil stability will be increased, the runoff of nutrients from topsoil will be reduced, and the fertility of soil at target sites will be increased.

D. Monitoring and evaluation
Monitoring and evaluation (M&E) will be applied in accordance with the established UNDP procedures throughout the project lifetime and will be developed in detail in the Full Proposal. The executing entity, together with the UNDP Country Office, will ensure the timeliness and quality delivery of the project implementation.

Audit: The project will be audited according to UNDP Financial Regulations and Rules and applicable audit policies on NIM implemented projects.

Project start
A project Inception Workshop (IW) will be held within the first three months of the project start date with those stakeholders with assigned roles in the project management, namely representatives from the Adaptation Fund (AF), UNDP Country Office and other stakeholders where appropriate. The IW is crucial to building ownership for the project results and to plan the first-year annual work plan (AWP).

Mid-term Review
The project will undergo an independent Midterm Review (MTR) at the mid-point of implementation. The evaluation will focus on the effectiveness, efficiency and timeliness of the implementation of project activities.

Furthermore, the MTR will highlight issues requiring decisions and actions and will present initial lessons learned about project design, implementation and management.

Project closure
An independent Final Evaluation will be undertaken three months prior to the final PSC meeting. The final evaluation will focus on the delivery of the project's results as initially planned and as corrected after the MTR.

Monitoring procedure
UNDP Tajikistan and CEP will be responsible for monitoring and evaluation (M&E) of the proposed project and for project output monitoring in line with the M&E policies and procedures. The M&E system will be governed by the following outlined principles.

- **Accountability**: ability of UNDP to be answerable to donors and to the beneficiaries through availability of specific, timely and relevant data.
- **Evidence-base**: readily available information to support the development of more appropriate and improved programmes in future.
- **Learning**: use of simplified and frequent reporting to support reflection, learning and sharing of good practices and solutions.
- **Transparency**: sharing of information with all of UNDP's stakeholders, including strategies, plans, budgets and reports to promote openness.

The project management team will produce the following deliverables for M&E throughout project implementation.

- An Issue Log shall be activated in ATLAS and updated by the PM to facilitate tracking and resolution of potential problems or requests for change.
- Based on the initial risk analysis submitted (see Annex 4[301]), a risk log shall be activated in ATLAS and regularly updated by reviewing the external environment that may affect project implementation.
- Based on information recorded in ATLAS, a Project Progress Report (PPR) shall be submitted by the PM to the PSC, using the standard report format.
- A project lesson learned log shall be activated and regularly updated to ensure ongoing learning and adaptation within the organisation, and to facilitate the preparation of the lessons learned report at the end of the project.
- A Monitoring Schedule Plan shall be activated in ATLAS and updated to track key management actions and events.
- **Annual Review Report**. An Annual Review Report shall be prepared by the Project Manager and shared with the PSC. As a minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the PR covering the whole year with updated information for each above element of the PR as well as a summary of results achieved against pre-defined annual targets at the output level.
- **Annual Project Review**. Based on the above report, an annual project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP) for the following year. In the last year, this review will be a final assessment. This review is driven by the PSC and may involve other stakeholders as required. It shall focus on the extent to which progress is being made towards outputs, and that these remain aligned to appropriate outcomes.

Together with UNDP, the PSC will carry out two independent external evaluations as follows.

- **Mid-Term Evaluation (MTE)**. The MTE will be carried out in the 6th quarter of the programme implementation and will be independent and external. The evaluation will engage all programme stakeholders and will assess the extent to which progress is being made towards the outputs and their alignment with outcomes. The evaluation may propose mid-course corrective measures and may reassess the objectives and revise implementation strategy.
- **Terminal Review (TR)**. The TR will be conducted at the conclusion of the programme. UNDP will commission a full external evaluation assessing the accomplishment of objectives.

Table 14 and 15 outlined the monitoring and evaluation plan, respectively. These outlines include the purpose of each M&E activity and the respective complementary actions.

[301] Annex 4 includes the detailed Environmental and Social Management Framework (ESMF) for the project.

Table 14. Monitoring plan for the proposed project including frequency and expected action(s).

Monitoring activity	Purpose	Frequency	Expected action(s)
Track results progress	Progress data against the results indicators in the RRF will be collected and analysed to assess the progress of the project in achieving the agreed outputs.	Quarterly, or in the frequency required for each indicator.	Slower than expected progress will be addressed by project management.
Monitor and Manage Risk	Identify specific risks that may threaten achievement of intended results. Identify and monitor risk management actions using a risk log. This includes monitoring measures and plans that may have been required as per UNDP's Social and Environmental Standards. Audits will be conducted in accordance with UNDP's audit policy to manage financial risk.	Quarterly	Risks are identified by project management and actions are taken to manage risk. The risk log is actively maintained to keep track of identified risks and actions taken.
Learn	Knowledge, good practices and lessons will be captured regularly, as well as actively sourced from other projects and partners and integrated back into the project.	At least annually	Relevant lessons are captured by the project team and used to inform management decisions.
Annual Project Quality Assurance	The quality of the project will be assessed against UNDP's quality standards to identify project strengths and weaknesses and to inform management decision making to improve the project.	Annually	Areas of strength and weakness will be reviewed by project management and used to inform decisions to improve project performance.
Review and Make Course Corrections	Internal review of data and evidence from all monitoring actions to inform decision making.	At least annually	Performance data, risks, lessons and quality will be discussed by the PSC and used to make course corrections.
Project Report	A progress report will be presented to the PSC and key stakeholders, consisting of progress data showing the results achieved against pre-defined annual targets at the output level, the annual project quality rating summary, an updated risk long with mitigation measures, and any evaluation or review reports prepared over the period.	Semi-annually, and at the end of the project (final report)	
Project Review/ Project Steering Committee (PSC)	The project's governance mechanism (i.e., the PSC) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In the project's final year, the PSC shall hold an end-of project review to capture lessons learned and discuss opportunities for scaling up and to socialize project results and lessons learned with relevant audiences.	Semi-annually	Any quality concerns or slower than expected progress should be discussed by the PSC and management actions agreed to address the issues identified.

Table 15. Evaluation plan for the proposed project including stakeholders and planned date of completion.

Evaluation activity	Planned completion date	Stakeholders
Mid-term Review (MTR)	August 2022	CEP; MEWR
Terminal Review (TR)	March 2023	CEP; MEWR

The respective costs for M&E are outlined in Table 16 according to the type of M&E activity.

Table 16. Monitoring and evaluation costs of the proposed project.

Type of M&E activity	Responsible parties	Budget (147,160 US$)	Timeframe
Direct Project Monitoring and Quality Assurance including	• Project Manager • Project team	(supported from staff costs	Quarterly, half-yearly and annually, as needed

Type of M&E activity	Responsible parties	Budget (147,160 US$)	Timeframe
progress and financial reporting, project revisions, technical assistance and risk management	• UNDP • External consultants – i.e. evaluation team	included in Project execution, and from MIE fee)	
Evaluations (Mid-term Evaluation and Terminal Review)	• Project Manager • Project team • UNDP	56,000	At midpoint and at end of project implementation
Audit	• Project Manager • Project team • UNDP	5,000	Annually, at year end
Inception meeting, field visits and steering committee meetings	• Project Manager • Project team • UNDP	86,160	Inception meeting within first two months and bi-annual PSC meetings (and sub-committee meetings)
TOTAL indicative cost		**147,160**	

Note: Above costs do not cover UNDP staff time. All UNDP staff costs associated with M&E are covered by the MIE Fee

E. Results framework

Table 17. Results framework for the proposed project outlining the indicators, targets, assumptions and sources of verification of the outcomes and outputs against the baseline.

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
Outcome 1. Catchment management strategy to manage climate risks operationalised at *raion* (district) and *jamoat* (sub-district) levels in Kofirnighan River Basin (KRB).	Number of staff trained to respond to impacts of climate-related events (gender disaggregated).	0	By the end of the project, at least 30 staff (of which at least 30% are women) trained on integrated catchment management. By the end of the project, at least 100 staff (of which at least 30% are women) trained on integrated catchment management.	• Attendance registers from training workshops • Workshop reports • Interviews with selected staff members of relevant ministries	Training workshops provide staff with the capacity to integrate climate resilience into integrated catchment management.
Output 1.1. Multi-hazard climate risk models (MHCRMs) developed for target watersheds in the KRB.	Number of risk models developed.	0	Gap analysis conducted for KRB that details climate risks for all watersheds. By the end of the project, at least one MHCRM developed for each watershed in the KRB (and each target district).	• Gap analysis • MHCRMs that detail climate risks for each watershed and target district • Results of studies including data and GIS information	Gap analysis and MHCRMs will inform the selection of vulnerable sites in the target districts as well as the identification of appropriate EbA interventions.
Output 1.2. Providing support for establishing automated weather stations in KRB sub-catchments to provide data for refining the multi-hazard climate models [developed under Output 1.1].	Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis.	Currently, weather stations do not provide up-to-date and relevant information in a timely manner to inform climate risks. There is limited delivery of climate information to local communities.	Policy- and decision-makers in KRB receive forecasts from Hydromet. By the end of the project, policy- and decision-makers in KRB receive forecasts and downscaled national climate information every quarter from Hydromet.	• Climate information packages • Interviews with government and local communities	Existing climate information producers are committed to participating in the development and implementation of forecasts and area-specific advisories.

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
			By the end of the project, local communities in the project interventions sites receive tailored climate information packages.		
Output 1.3. Integrated catchment management strategy developed for the KRB.	Integrated catchment management strategy developed. Number of staff trained (gender disaggregated). Number of community members trained (gender disaggregated).	0	By year 3 of the project, at least 30 staff (of which at least 30% are women) trained on integrated catchment management across all target departments. By the end of the project, at least 100 staff (of which at least 30% are women) trained on integrated catchment management across all target departments. At least 100 community members in each district (of which 30% are women) trained on identification of suitable EbA interventions (600 people in total).	• Project reports • Monitoring and evaluation reports per intervention site • Reports on community consultations, trainings and surveys • Reports on site/field visits	Training workshops provide staff with the capacity to integrate climate resilience into integrated catchment management. All communities surrounding project intervention sites are committed to participating in project activities, taking up/adopting climate resilient techniques and practices and providing training to other officers/community members.
Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	Number of interactions between relevant stakeholders	0	By the end of the project, at least 2 meetings are held per year between different government sectors, RBOs, district authorities etc.	• Meeting reports • Monitoring and evaluation reports • Annual workplans • Meeting minutes and reports	Institutions, government ministries and agencies are committed to participating in and addressing climate risks, with integrated catchment management central to the adaptation pathway for KRB.

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
Output 1.5. Payment for Ecosystem Services (PES) models to support the long-term financing of integrated catchment management strategy implementation.	Number of PES models developed for the KRB	0	By the end of the project, at least 1 PES model developed and at least one policy brief submitted to government detailing the model.	• Policy brief on PES model • Meeting reports • Monitoring and evaluation reports	Institutions, government ministries and agencies are committed to participating in and addressing climate risks, with integrated catchment management central to the adaptation pathway for KRB.
Outcome 2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	Number of people practising climate change adaptation technologies (gender disaggregated). Total number of men and women benefitting from reduced vulnerability to climate change	0	At least 600 people (100 per district), of which at least 30% will be women, are implementing EbA interventions for climate risk management. At least 46,000 people in ~100 villages across 6 districts benefitting from reduced vulnerability to climate change	• Registers of project beneficiaries at each site • Site visits • Community surveys.	Community members continue to practice adaptation technologies once they have been trained and provided with the necessary equipment.
Output 2.1. Agro-ecological extension services supported at the *jamoat* level to provide technical support for EbA implementation.	Number of extension service providers trained.	0	At least 1 private extension service provider in each target KRB district supported	• Annual workplans • Workshop reports • Monitoring and evaluation reports	All communities surrounding project intervention sites are committed to participating in project activities, taking up/adopting climate-resilient EbA techniques and practices and providing training to other community members.
Output 2.2. Watershed Action Plans (WAPs) developed that promote climate resilience and enhance economic	Number of WAPs developed.	0	By the end of the project, at least 1 WAP developed in each of the 14 target *jamoats*.	• Annual workplans developed for the WAPs • Monitoring and evaluation reports	None of the *jamoats* have overlapping watersheds in the project area.

Expected outcome/ outputs	Outcome/ output indicator	Baseline	Target	Sources of verification	Assumptions
productivity for target communities.					
	Number of hectares of land with EbA activities implemented at project sites in each district	0	At least 250 ha of land in each district undergoing EbA implementation (1,500 ha in total).	• Monitoring and evaluation reports per intervention site • Reports on community consultations/trainings and field visits • GIS	All communities surrounding project intervention sites are committed to participating in project activities and taking up/adopting climate-resilient techniques and practices.
Outcome 3. Existing knowledge management platforms supported for integrated catchment management and EbA.	Knowledge management centre strengthened through the support of project activities	0	By the end of the project at least 1 knowledge centre has been strengthened.	• Reports and training materials • Monitoring and evaluation reports	Strengthening existing knowledge management centres promotes local knowledge sharing and raises awareness among communities.
Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.	Existing knowledge centre/ platforms/ hubs in Tajikistan are supported and include information and data on KRB and specifically climate risk information.	Climate change research is not coordinated within the KRB and across Tajikistan. Knowledge generated through projects is not collated, shared or disseminated.	By the end of the project at least 1 knowledge centre has been strengthened.	• Meeting/workshop reports • Minutes from forum meetings	All representatives involved in the knowledge centres (public institutions, NGOs and resource users etc.) are dedicated to developing, adopting and implementing interdisciplinary approaches to climate resilient EbA techniques and practices for integrated catchment management in the KRB specifically.
Output 3.2. An impact evaluation framework (IEF) to enable effective adaptive management of EbA activities.	Evaluation of EbA interventions in target sites conducted.	Several projects have undertaken activities on climate change adaptation within Tajikistan. However, none of these activities have been evaluated according to their impacts for communities.	By the end of the project, an IEF will be developed that details the process of evaluating the impact of implemented EbA measures on communities.	• Site visits • Data collection • Community consultation • Data analysis of EbA impacts	Community members will be more aware of EbA interventions in and surrounding their communities. By conducting the IEF, awareness on the benefits of EbA interventions will be raised.

F. Alignment with Adaptation Fund Results Framework

Table 18. Project alignment with the Adaptation Fund Results Framework including Outcome and Output Indicators.

Project Objective(s)[302]	**Project Objective Indicator**(s)	**Fund Outcome**	**Fund Outcome Indicator**	**Grant Amount** (US$)
Reduce vulnerability and enhance climate-resilience of small-scale farmers and pastoralists in Tajikistan to respond to the impacts of climate change.	Total number of men and women benefitting from reduced vulnerability to climate change Percentage population of the KRB benefitting from project interventions. Expected: ~5%	**Outcome 2.** Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	**2.1.** No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks **2.2.** Number of people with reduced risk to extreme weather events	**9,996,441**
		Outcome 3. Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	**3.2.** Modification of behaviour in targeted population	
		Outcome 5. Increased ecosystem resilience in response to climate change and variability-induced stress	**5.** Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress	
		Outcome 6. Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	**6.1.** Percentage of households and communities having more secure (increased) access to livelihood assets **6.2.** Percentage of targeted population with sustained climate-resilient livelihoods	
Project Outcome(s)	**Project Outcome Indicator**(s)	**Fund Output**	**Fund Output Indicator**	**Grant Amount** (US$)
Outcome 1. Catchment management strategy to manage climate risks operationalised at *raion* (district) and *jamoat* (sub-district) levels in Kofirnighan River Basin (KRB).	Number of staff trained to respond to impacts of climate-related events (gender disaggregated)	**Output 2.2.** Targeted population groups covered by adequate risk reduction systems	**2.1.2.** Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased **2.2.1.** Percentage of population covered by adequate risk reduction systems	**1,012,000**

[302] The AF utilised OECD/DAC terminology for its results framework. Project proponents may use different terminology, but the overall principle should still apply.

Outcome 2. An integrated approach to building climate resilience of agro-ecological landscapes operationalised at a village level.	Number of people practising climate change adaptation technologies (gender disaggregated). Number of hectares of land with EbA activities implemented at project sites in each district	**Output 5.** Vulnerable physical, natural and social assets strengthened in response to climate change impacts, including variability	**5.1.** No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)	**7,282,810**
		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 (physical as well as knowledge) created in support of individual or community-livelihood strategies	
Outcome 3. Existing knowledge management platforms supported for integrated catchment management and EbA.	Knowledge management centre strengthened through the support of project activities	**Output 3.** Targeted population groups participating in adaptation and risk reduction awareness activities	**3.1.1.** No. and type of risk reduction actions or strategies introduced at local level	**142,500**

Table 19. Adaptation Fund Core Indicators: i) number of beneficiaries; ii) increased income, or avoided decrease in income; and iii) natural assets protected or rehabilitated.

Adaptation Fund Core Impact Indicators				
Date of Report	3 September 2018			
Project Title	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan			
Country	Tajikistan			
Implementing Agency	UNDP			
Project Duration	5 years			
Adaptation Fund Core Impact Indicator "Number of Beneficiaries"				
	Baseline *(absolute number)*	Target at project approval *(absolute number)*	Adjusted target first year of implementation *(absolute number)*	Actual at completion[303] *(absolute number)*
Direct beneficiaries supported by the project	**0**	**46,000**		
Female direct beneficiaries	0	25,000		
Youth direct beneficiaries	0	Unknown		
Indirect beneficiaries supported by the project	**0**	**828,000**		
Female indirect beneficiaries	0	409,612 [304,305]		

[303] At project completion, the proponent could report on % targeted population reached or successfully supported (the absolute numbers could then be deduced from that figure).
[304] In 2016, 49.76% of Tajikistan's total population was female
[305] Trading Economics. Tajikistan - Population, female (% of total). Accessed 31 August 2018.

Youth indirect beneficiaries	0	Unknown		
Adaptation Fund Impact Indicator "Increased income, or avoided decrease in income"				
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion
Income Source[306] *(name)*	**Livestock, crops (fodder, food), fuelwood**	**Livestock, crops (fodder, food), fuelwood**		
Income Source				
Income level *(USD)*	unknown	unknown		
Number of households *(total number in the project area)* *(report for each project component)*	unknown	600 (component 2.0)		
Adaptation Fund Core Impact Indicator "Natural Assets Protected or Rehabilitated"				
	Baseline	Target at project approval	Adjusted target first year of implementation	Actual at completion[307]
Natural Asset or Ecosystem *(type)*	Degraded ecosystems (forest, rangeland, river and drainage line)	Conserved or rehabilitated ecosystems (forest, rangeland, river and drainage line)		
Change in state *Ha or km Protected/rehabilitated, or Effectiveness of protection/rehabilitation - Scale (1-5)*	0 ha Scale 1 (not improved)	At least 1,500 ha Scale 3 (moderately improved)		
Total number of natural assets or ecosystems protected/rehabilitated	0 ha	At least 1,500 ha		

[306] When the numbers of livelihoods go through significant changes, such as when sources of income are diversified, it may be useful to illustrate the changes by primary livelihoods.

[307] At project completion, the proponent could report on % targeted population reached or successfully supported (the absolute numbers could then be deduced from that figure).

G. Workplan and Budget

Workplan

The tentative workplan for the proposed project is presented in the table below. This workplan indicates the proposed duration for activities under each output, as well as the expected year in which the output is expected to be delivered.

Components and Outputs		Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Component 1. Integrated catchment management to build climate resilience.	Output 1.1. Multi-hazard climate risk models developed for vulnerable watersheds in the Kofirnighan River Basin.																				
	Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.																				
	Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.																				
	Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.																				
	Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.																				
Component 2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land	Output 2.1. Agro-ecological extension services supported at the *jamoat* level to provide technical support for EbA implementation.																				
	Output 2.2. Watershed Action Plans developed that promote climate resilience																				

Management, in agro-ecological landscapes.	and enhance economic productivity for target communities.																					
	Output 2.3. EbA interventions implemented in target watersheds by local communities.																					
Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the Kofirnighan River Basin.	Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.																					
	Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.																					

Budget

Award ID	00113350			Project ID	00111538							
Project Title	An integrated landscape approach to enhancing the climate resilience of small-scale farmers and pastoralists in Tajikistan											
Business Unit	TJK10											
PIMS No.	PIMS 6219											
Implementing Partner	Committee for Environmental Protection (CEP)											
Outcome/ Atlas Activity	**Responsible Party/ Implementing Agent**	**Fund ID**	**Donor Name**	**Atlas Budgetary Account Code**	**ATLAS Budget Description**	**Amount Year 1 (USD)**	**Amount Year 2 (USD)**	**Amount Year 3 (USD)**	**Amount Year 4 (USD)**	**Amount Year 5 (USD)**	**Total (USD)**	**Budget Notes**
Component 1. Integrated catchment management to	UNDP/CEP	62040	AF	71200	International consultant	83,500	69,000	-	-	-	152,500	1
				71300	Local consultant	81,000	74,000	30,000	-	-	185,000	2

build climate resilience.				71600	Travel	10,000	10,000	10,000	10,000	-	40,000	3
				72100	Contractual Services-Companies	40,000	-	10,000	10,000	10,000	70,000	5
				72300	Materials & Goods	70,000	70,000	70,000	-	-	210,000	7
				72400	Audio Visual&Print Prod Costs	-	15,000	5,000	5,000	5,000	30,000	6
				74500	Miscellaneous Expenses	20,000	10,000	10,000	10,000	10,500	60,500	8
				75700	Training, Workshops and Confer	98,000	88,000	63,000	15,000	-	264,000	4
					Total Outcome 1	**402,500**	**336,000**	**198,000**	**50,000**	**25,500**	**1,012,000**	
Component 2. Ecosystem-based Adaptation, including Climate smart Agriculture and Sustainable Land Management, in agro-ecological landscapes.	UNDP/CEP			71300	Local consultant	-	100,000	-	-	-	100,000	2
				71400	Contractual Services - Individ	36,000	36,000	36,000	36,000	36,000	180,000	10
				71600	Travel	15,000	15,000	15,000	14,000	15,000	74,000	3
				72100	Contractual Services-Companies	-	3,358,000	2,123,500	1,123,500	123,500	6,728,500	5
				74200	Audio Visual&Print Prod Costs	-	24,310	-	-	-	24,310	9
				75700	Training, Workshops and Confer	20,000	75,000	48,000	18,000	15,000	176,000	4
					Total Outcome 2	**71,000**	**3,608,310**	**2,222,500**	**1,191,500**	**189,500**	**7,282,810**	
Component 3. Knowledge management on building climate resilience through integrated catchment management and EbA in the KRB.	UNDP/CEP	62040	AF	71200	International consultant	36,500	-	-	-	-	36,500	1
				71600	Travel	1,000	1,000	1,000	1,000	1,000	5,000	3
				72100	Contractual Services-Companies	20,000	20,000	12,000	19,000	20,000	91,000	5
				74500	Miscellaneous Expenses	10,000	-	-	-	-	10,000	8
					Total Outcome 3	**67,500**	**21,000**	**13,000**	**20,000**	**21,000**	**142,500**	
Project Execution Cost	**UNDP**	62040	**AF**	71400	Contractual Services - Individ	85,000	85,000	85,000	85,000	85,000	425,000	10
				71600	Travel	7,000	7,000	7,000	7,000	7,000	35,000	3

				72200	Equipment and Furniture	60,000	-	-	-	-	60,000	14
				72400	Communic & Audio Visual Equip	2,500	2,500	2,500	2,500	2,500	12,500	11
				73100	Rental & Maintenance-Premises	5,000	5,000	5,000	5,000	5,000	25,000	12
				73400	Rental & Maint of Other Equip	5,000	5,000	5,000	5,000	2,500	22,500	15
				74100	Professional Services	1,000	1,000	29,000	1,000	29,000	61,000	13
				74596	Direct project cost	17,000	36,000	43,000	26,000	10,000	132,000	16
				75700	Training, Workshops and Confer	3,000	-	-	-	-	3,000	4
				Total project execution cost		**185,500**	**141,500**	**176,500**	**131,500**	**141,000**	**776,000**	
Implementing Entity Fee (8.5%)						**350,304**	**209,447**	**133,110**	**71,043**	**19,227**	**783,131**	
Total Project Costs						**1,076,804**	**4,316,257**	**2,743,110**	**1,464,043**	**396,227**	**9,996,441**	

Budget note number	Budget Notes
1	International consultant (daily fee of US$650 * 50 days + US$4,000 air fare) for Multi-Hazard Climate Risk Modeling; International consultant (IT expert - daily fee of US$650 * 30 days + US$4,000 air fare) for collecting and collating data; International Consultant (Catchment management expert - daily fee of US650 for 100 days + US$4,000 air fare) on climate strategy; International Consultant (Training expert on integrated catchment management, daily fee of US$ 650 for 30 days + US$ 4,000 air fare) to develop a Training programme on integrated catchment management; International consultant (US$650 * 50 days + US$4,000 air fare) for development of an evaluation framework
2	National consultant to conduct gap analyses (US$200*125 days) National consultants to support development of Multi-Hazard Climate Risk Models (US$200*100 days) National consultants to support data collection and collation (US$200*50 days) National consultants to support trainings of local community members to receive advisories (US$200*150 days) National consultants to support the development of the climate strategy (2pers* US$200*100 days) National consultants to assist international consultants in conducting training programme on integrated catchment management and to continue training workshops in Year 2 (US$200*100 days) National Environmental Economist and National Policy Expert, for development of PES models (2 pers.*US$200*100 days) National Watershed Expert for participatory mapping (US$200 for 150 days) National Communications Expert for participatory mapping (US$200 for 150 days) National consultants on WAPs development (2pers.*US$200*100days)
3	Travel to target districts

4	Workshops (10 district-level workshops and 3 national-level workshops) on climate strategy; - $25,000 Training workshops (6 3-day workshops @US$5,000 per workshop) on integrated catchment management + training materials - $50,000; Training materials, trainings (assume US$10,000 for training materials, 2 trainings per year per jamoat at US$1,000 per training); - $94,000 Workshops for RBOs, RBCs, districts and jamoats. Assume 1 workshop in each district + 2 workshops in Dushanbe on strengthening the coordination systems - $50,000 Workshops for CEP and other relevant government staff on integrating EbA in catchment management - $20,000 Workshops at district and national level (12 district-level workshop, 3 national-level workshops) on PES model development - $55,000 Training for EbA and FFS service providers - $91,000 Community meetings (Meetings to be held across multiple villages; assume 3 meetings per jamoat, US$500 per meeting) on participatory mapping - $21,000 Workshop per jamoat on developing community monitoring plans - $20,000 + Inception workshop - $3,000 Training for Nursery staff - $14,000
5	Contractual Services for GIS multihazard climate risk data modeling for first year - $40,000. Contract for disseminating regular advisories via SMS - $30,000 Contactual services for civil works / Contract for knowledge management centre - database maintenance, knowledge dissemination - $91,000 EbA demonstration plots for villages – 100 villages, US$3,000 per plot to be established, plus US$200 for upkeep for each EbA plot per annum * 3 years - $360,000 14 nurseries, US$10,000 to establish each nursery and US$973.22 upkeep for each nursery per annum * 4 years - $194,500 Inputs for 100 villages to implement EbA - estimated US$58,140 per village - $5,814,000 Farmer field schools - 100 villages, assume US$900 per field school per annum - $360,000
6	Basic phones + airtime for 100 community representatives;
7	Materials and inputs for 3 AWS Stations (US$70,000 per station * 3 stations) - $210,000
8	Miscellaneous Expenses (including bank charges, insurance);
9	Printing of mapping materials ($2,310) + printing & miscellaneous ($10,000) + translation services ($12,000)
10	All project personnel fees (Project Manager, Administrative/Finance Assistant, Field staff (3 @ US7,000 p.a.) Programme Assistant, Project Analyst, Project Engineer)
11	Communication cost (internet, mobile and landline phones);
12	Office rent
13	Mid-term review of the project by team of consultants (28,000 USD); Final review of the project by team of consultants (28,000 USD); Audit Fees (5,000 USD)
14	Procurement of vehicle for visits to target districts for implementation of project activities;
15	All cost associated with vehicle running, like regular maintenance, etc.;
16	Expenditures for the services on HR, procurement, IT, security provided by CO.

Annual expenditure per output						
Output	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Output 1.1. Multi-hazard climate risk models developed for vulnerable watersheds in the Kofirnighan River Basin.	$ 111,500	$ 10,000	$ -	$ -	$ -	**$ 121,500**
Output 1.2. Support provided for upgrading automated weather stations in Kofirnighan River Basin watersheds.	$ 133,500	$ 105,000	$ 105,000	$ 25,000	$ 25,500	**$ 394,000**

Output 1.3. Integrated catchment management strategy developed for the Kofirnighan River Basin.	$ 92,500	$ 156,000	$ 58,000	$ 15,000	$ -	**$ 321,500**
Output 1.4. Strengthened coordination and training mechanisms for integrated climate-resilient catchment management.	$ 35,000	$ 10,000	$ 25,000	$ -	$ -	**$ 70,000**
Output 1.5. Payment for Ecosystem Services models to support the long-term financing of integrated catchment management strategy implementation.	$ 30,000	$ 55,000	$ 10,000	$ 10,000	$ -	**$ 105,000**
Output 2.1. Agro-ecological extension services supported at the *jamoat* level to provide technical support for EbA implementation.	$ -	$ 390,000	$ 140,000	$ 110,000	$ 110,000	**$ 750,000**
Output 2.2. Watershed Action Plans developed that promote climate resilience and enhance economic productivity for target communities.	$ 36,000	$ 181,310	$ 36,000	$ 36,000	$ 36,000	**$ 325,310**
Output 2.3. EbA interventions implemented in target watersheds by local communities.	$ 35,000	$ 3,037,000	$ 2,046,500	$ 1,045,500	$ 43,500	**$ 6,207,500**
Output 3.1. Existing knowledge management platforms supported for collating information on the planning, implementation and financing of EbA interventions.	$ 20,000	$ 20,000	$ 12,000	$ 19,000	$ 20,000	**$ 91,000**
Output 3.2. An impact evaluation framework established to enable effective adaptive management of EbA activities.	$ 47,500	$ 1,000	$ 1,000	$ 1,000	$ 1,000	**$ 51,500**
PMC	$ 185,500	$ 141,500	$ 176,500	$ 131,500	$ 141,000	**$ 776,000**
Implementing Entity Fee (8.5%)	$ 350,304	$ 209,447	$ 133,110	$ 71,043	$ 19,227	**$ 783,131**
					Grand Total:	**$ 9,996,441**

Annual expenditure by activity						
Activity	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
1.1.1. Conduct a gap analysis on existing risk	$ 25,000	$ -	$ -	$ -	$ -	**$ 25,000**

information in the Kofirnighan River Basin.						
1.1.2. Develop Multi-Hazard Climate Risk Models for the Kofirnighan River Basin.	$ 86,500	$ 10,000	$ -	$ -	$ -	**$ 96,500**
1.2.1. Provide technical support for the modernisation of automated weather stations in the most vulnerable districts of the Kofirnighan River Basin.	$ 90,000	$ 80,000	$ 80,000	$ 10,000	$ 10,500	**$ 270,500**
1.2.2. Collect and collate data from improved automated weather stations.	$ 33,500	$ -	$ -	$ -	$ -	**$ 33,500**
1.2.3. Use collected data to inform climate risk information and adaptation advisories for agro ecological extension service providers.	$ 10,000	$ 25,000	$ 25,000	$ 15,000	$ 15,000	**$ 90,000**
1.3.1. Develop an integrated catchment management strategy for the Kofirnighan River Basin to inform and facilitate cross-sectoral landscape planning.	$ -	$ 89,000	$ 30,000	$ 15,000	$ -	**$ 134,000**
1.3.2. Deliver a training programme on mainstreaming climate risks for integrated catchment management planning.	$ 54,500	$ 39,000	$ -	$ -	$ -	**$ 93,500**
1.3.3. Provide training for selected communities on identification of EbA activities and implementation.	$ 38,000	$ 28,000	$ 28,000	$ -	$ -	**$ 94,000**
1.4.1. Strengthen existing training mechanisms at the raion and jamoat levels.	$ 25,000	$ -	$ 25,000	$ -	$ -	**$ 50,000**
1.4.2. Provide training on integrating EbA into catchment management.	$ 10,000	$ 10,000	$ -	$ -	$ -	**$ 20,000**
1.5.1. Develop suitable Payment for Ecosystem Services models for the KRB.	$ 30,000	$ 55,000	$ 10,000	$ 10,000	$ -	**$ 105,000**

2.1.1. Support agro-ecological extension services by training existing service providers on EbA, climate-resilient agriculture and multi-hazard climate risk management.	$ -	$ -	$ 30,000	$ -	$ -	**$ 30,000**
2.1.2. Establish EbA demonstration plots in each of the target villages.	$ -	$ 300,000	$ 20,000	$ 20,000	$ 20,000	**$ 360,000**
2.1.3. Conduct farmer field schools (FFs) in target villages making use of demonstration plots.	$ -	$ 90,000	$ 90,000	$ 90,000	$ 90,000	**$ 360,000**
2.2.1. Conduct participatory mapping at the watershed level.	$ 36,000	$ 119,310	$ 36,000	$ 36,000	$ 36,000	**$ 263,310**
2.2.2. Develop Watershed Action Plans (WAPs) for vulnerable watersheds in the Kofirnighan River Basin.	$ -	$ 62,000	$ -	$ -	$ -	**$ 62,000**
2.3.1. Support local communities to implement priority EbA interventions.	$ -	$ 2,982,000	$ 2,013,500	$ 1,013,500	$ 13,500	**$ 6,022,500**
2.3.2. Support local community members in developing Enterprise Plans (EPs) based on EbA interventions.	$ 20,000	$ 20,000	$ 18,000	$ 18,000	$ 15,000	**$ 91,000**
2.3.3. Monitor the impacts of EbA interventions.	$ 15,000	$ 35,000	$ 15,000	$ 14,000	$ 15,000	**$ 94,000**
3.1.1. Support existing knowledge management platforms responsible for collating, analysing and disseminating information on climate risks and suitable adaptation options.	$ 20,000	$ 20,000	$ 12,000	$ 19,000	$ 20,000	**$ 91,000**
3.1.2. Collect and collate data and information from automated weather stations, agro ecological extension centres and international publications.	$ -	$ -	$ -	$ -	$ -	**$ -**

3.2.1. Establish an impact evaluation framework to enable the effective quantification of project benefits and to provide information for future planning and implementation of EbA interventions.	$ 46,500	$ -	$ -	$ -	$ -	**$ 46,500**
3.2.2. Obtain data and information through applying the framework will be disseminated via the knowledge platform(s).	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	**$ 5,000**
PMC	$ 185,500	$ 141,500	$ 176,500	$ 131,500	$ 141,000	**$ 776,000**
Implementing Entity Fee (8.5%)	$ 350,304	$ 209,447	$ 133,110	$ 71,043	$ 19,227	**$ 783,131**
					Grand Total	**$ 9,996,441**

H. Disbursement schedule

A disbursement schedule including budget distributed per year of project implementation is detailed below.

Table 20. Disbursement schedule including milestones.

	Upon agreement & signature (US$)	**After Year 1** (US$)	**After Year 2** (US$)	**After Year 3** (US$)	**After Year 4** (US$)	**Total disbursed** (over 5 years)
Scheduled date (tentative)	1-Mar-2020	1-Mar-2021	1-Mar-2022	1-Mar-2023	1-Mar-2024	
Project funds	541,000	3,965,310	2,433,500	1,261,500	236,000	8,437,310
Project Execution Cost	185,500	141,500	176,500	131,500	141,000	776,000
Implementing Entity fee (8.5%)	350,304	209,447	133,110	71,043	19,227	783,131
					Total	**9,996,441**

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

A. Record of endorsement on behalf of the government[308]

A list of all endorsements for the project is provided in Table 22. See Annex 2 for all endorsement letters[309].

Table 20. List of endorsements provided for the proposed project.

Khayrullo Ibodzoda – Chairman of the Committee for the Environmental Protection (CEP) under the Government of the Republic of Tajikistan	Date*:* January, 19, 2018

B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project contact person's name, telephone number and email address.

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 and subject to the approval by the Adaptation Fund Board, commit to implementing the project in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project.	
 Pradeep Kurukulasuriya Executive Coordinator & Director- Global Environmental Finance & Lead, Natural Capital and the Environment Bureau for Policy and Programme Support (BPPS)/ Global Policy Network United Nations Development Programme	
Date: 15 April 2019	Tel and e-mail: pradeep.kurukulasuriya@undp.org
Project Contact Person: Ms. Keti Chachibaia	
Tel. And Email: keti.chachibaia@undp.org	

[308] Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.
[309] Annex 2 includes endorsement letters from

LIST OF ANNEXURES

All annexures have been included as a separate attachment to the Full Proposal.

Annex 1. Consolidated stakeholder consultations and missions report
Annex 2. Endorsement letter
Annex 3. Justification for selection of the Kofirnighan River Basin
Annex 4. Environmental and Social Management Framework (ESMF)
Annex 5. Hydromet list of needs for the repair and rehabilitation of weather stations
Annex 6. UNDP Social and Environmental Screening Procedure (SESP)
Annex 7. Letter of Agreement between UNDP and Government for the provision of Support Services
Annex 8. UNDP Fees for Support to Adaptation Fund Project
Annex 9. Cost-benefit analyses of proposed community-level interventions

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End of Full Proposal