ADAPTATION FUND

REQUEST FOR PROJECT/PROGRAMME FUNDING FROM THE ADAPTATION FUND

Project concept: Harnessing the water-energy-food nexus to address and adapt to climate change impacts in Tawi-Tawi

ADAPTATION FUND

PROJECT/PROGRAMME PROPOSAL TO THE ADAPTATION FUND

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	REGULAR PROJECT
Country/ies:	REPUBLIC OF THE PHILIPPINES
Title of Project/Programme:	**Harnessing the water-energy-food nexus to address and adapt to climate change impacts in Tawi-Tawi**
Type of Implementing Entity:	MULTILATERAL IMPLEMENTING ENTITY
Implementing Entity:	United Nations Industrial Development Organization (UNIDO)
Executing Entity/ies:	1. United Nations Industrial Development Organization (UNIDO) 2. Mindanao Development Authority (MinDA)
Amount of Financing Requested:	5,463,643 (in U.S Dollars Equivalent)

Project / Programme Background and Context:

Short summary of the project

The project will be implemented in the two island municipalities (Sitangkai and Sibutu) in the province of Tawi-Tawi, Bangsamoro Autonomous Region in Muslim Mindanao, Philippines. It is targeting the water security issue in these two island municipalities. The islands are increasingly affected by climate change through a sea-level rise (saline water intrusion) and more unpredictable rains, impacting water resources available for the communities on the islands.

One of the main income sources for the communities in the project area is seaweeds farming. The seaweed farming communities already face water insecurity, which will only get worse due to projected climate change impacts. The project seeks to increase adaptive capacity of the communities in Sibutu and Sitangkai, through provision of reliable, climate resilient access to water infrastructure and services. Also, it will strengthen livelihoods and sources of income of vulnerable seaweeds producing communities in Sibutu and Sitangkai through improvement of seaweed industry. Finally, the project activities will build awareness and ownership of adaptation and climate risk reduction strategies within local communities and local government units (LGUs) in Sibutu and Sitangkai, as well as in the wider region.

Additionally, the project activities will focus on capturing opportunity of increasing productivity of seaweed farms and quality of raw dried seaweeds, thanks to increased availability of freshwater. Working with local communities the project will focus on developing and improving seaweed production strategies to cope with climate change impacts, including predicted environmental variability and utilising available water resources. This in turn will strengthen livelihoods and sources of income of vulnerable seaweeds producing communities in Tawi-Tawi. It is estimated that total of 71,562 people would benefit directly from the project (with 35,423 women and 36,139 men) and more than 150,000 people indirectly.

Project area

The Philippines is an archipelago comprised of 7,107 islands (1,000 of which are inhabitable), with a humid climate and a topography characterized by mountainous terrain bordered by narrow coastal plains. Considered one of the most biologically

rich and diverse countries in the world, the Philippines also has one of the world's longest coastlines, and its marine and coastal resources yield US$3.5 billion annually in goods and services. The Philippines' main economic sectors are agriculture and industry, with agriculture contributing 14% of gross domestic product and employing over a third of the population. The Philippines is also considered to be among the world's most disaster-prone countries (floods, droughts, typhoons, landslides and mudslides, earthquakes, and volcanic eruptions). Recent decades have witnessed an increase in damaging extreme events, such as heavy rainfall and tropical cyclone activity and this trend is expected to continue under a changing climate. Sea-level rise is happening at an above-average rate for some parts of the Philippines, exposing up to one million people to flooding from rising sea levels by 2070–2100[1]

Figure 1. Location of the project area on the Philippines map marked with red ellipse.

Source: https://en.wikipedia.org/wiki/File:Ph_physical_map.png

The proposed project areas are **the island municipalities of Sitangkai and Sibutu in the Tawi-Tawi province** (part of the Bangsamoro Autonomous Region in Muslim Mindanao – BARMM) in the Philippines.

These municipalities have been selected based on the following criteria:

1) Vulnerability to climate change of the local seaweed farming communities. The low-lying setting of the islands surrounded by water and relatively exposed to predominant wind makes them susceptible to storm surge and sea level rise. Tawi-Tawi faces sea level rise of 8 mm/year, according to the map of rates of sea level changes in the Philippines between 1993 and 2009 [2]. Tawi-Tawi is among the most vulnerable to climate change impacts in the country and has the lowest adaptive capacity, and this is aggravated by having the lowest electricity and water access in the Philippines. Most of the seaweed farming communities in Sitangkai rely on rainwater harvesting, imported ground water from Sibutu and costly bottled water from other islands. Rising sea level and altered rainfall pattern increase the risk of water shortage and increased water cost for the communities.

2) Ongoing activities in the region which provide a solid project baseline for adaptation intervention:

a. The Renewable Energy Technology to Increase Value Added of Seaweeds in Tawi-Tawi (RETS) project is developing hybrid renewable-diesel mini-grids in Sitangkai and Sibutu to increase access to electricity. The project is also conducting feasibility studies of water supply systems in these 2 island municipalities.

b. The Integration of Productive Uses of Renewable Energy for Inclusive and Sustainable Energization in Mindanao (I-PURE Mindanao) project is developing distributed renewable energy systems also to increase access in off-grid communities in the region.

c. The research program Establishment of the Seaweed Research and Establishment of Seaweed Research and Development Center (SeaRDeC) to support the Seaweed Industry in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) aims to increase the production of high quality raw dried seaweeds that will in turn increase the prices of RDS and thus increase the income of seaweeds farmers.

d. The Mindanao Water Supply Program of MinDA (or MinDA Water) is a funding program in partnership with a national development bank for the implementation of water supply systems in BARMM.

Tawi-Tawi province is the largest seaweeds producer in the country, and communities are heavily dependent on seaweed farming. Facilitating seaweeds processing in-situ by provision of reliable freshwater access (proposed adaptation project) complementing the on-going activities for provision of electricity (RETS and I-PURE baseline projects) will increase economic sustainability of the local communities therefore increasing their overall resilience to climate change. Sitangkai and Sibutu are the top seaweed producers in Tawi-Tawi province, hence communities at those two localities highly depend on seaweed production for livelihood generation.

[1] Climate Risk Country Profile: Philippines (2021): The World Bank Group and the Asian Development Bank.

[2] Siringan F.P., Samson M., Myy S. M., Licuanan W., Rollon R., 2013, Coastal Integrity Vulnerability Assessment Tool, In: Vulnerability Assessment Tools for Coastal Ecosystems: A Guidebook. Marine Environment and Resources Foundation, Inc., Quezon City, Philippines

The project site selection also considers scalability of the intervention – this intervention may be scaled up to other seaweed farming communities in Tawi-Tawi Province and other provinces of the BARMM region and the Philippines, which face similar issues of poor access to reliable electricity and water supply in the context of increasing effects of climate change.

Therefore, the proposed adaptation project seeks to address water security issue in these two island municipalities building on and complementing already ongoing activities in the region.

Figure 2. General map and satellite image of the project area – Sibutu and Sitangkai islands.

Source: *https://www.openstreetmap.org, https://s2maps.eu/*

Bangsamoro Autonomous Region of Muslim Mindanao (BARMM)

The BARMM includes the predominantly Muslim provinces of Maguindanao and Lanao del Sur in mainland Mindanao, and the island provinces of Basilan, Sulu, and Tawi-Tawi, and the Islamic city of Marawi City. It is the only region of the Philippines that has its own government. BARMM's population is about 4.4 million based on the 2020 Census. This represents 16.78% of the overall population of Mindanao, or 4.04% of the entire population of the Philippines.[3]

The region first obtained special autonomous status in 1990, with the right to elect its own officials, levy taxes, and set education and development policy. The BARMM was formed with the ratification of its basic law, the Bangsamoro Organic Law following two-part legally binding plebiscite in Western Mindanao held on January 21 and February 6, 2019.[4]

BARMM is one of the poorest regions in the country, due to continuing armed conflict, limited livelihood opportunities, inadequate social services, weak institutions, and deep political, cultural and economic inequity, and generations of systemic injustice and armed violence. The region faces serious development challenges that must be overcome.[5]

The agriculture, fisheries and forestry sectors are the largest contributor to the BARMM regional economy, representing 63.5% of the total regional value added.[6] In turn, BARMM accounts for the largest share of national fisheries and seaweeds production.[7] Some of the local communities in the region are highly dependent on local seaweed production (and fisheries).

Though rich in natural resources but with a poverty incidence rate of 63 percent, BARMM is one of the poorest regions in the country. It holds one of the highest levels of infant and maternal mortality and one of the lowest life expectancies.

[3] https://www.philatlas.com/mindanao/barmm.html
[4] http://barmm.popcom.gov.ph/socio-demographic-profile/
[5] BDP, p. 2.
[6] BDP, p. 20.
[7] Mindanao Energy Plan 2018-2040

Contributing to this high poverty incidence and aggravating the social conditions of BARMM are the poor access to electricity, water, and sanitation services, three most basic economic and social services. BARMM, based on the latest data from National Electrification Administration (NEA), has an average electricity access of only 34%, the lowest in the country. The BARMM region has also the lowest water supply coverage at only around 48%,[8] with only 7% of the population having access to Level 3 water supply, 8% Level 2, and the majority 85% having only level 1 access.[9] BARMM has also the lowest improved sanitation coverage of about 20%.[10] COVID-19 pandemic made the situation only worse - according to recent study, "one of the most challenging aspects of COVID was access to Water, Sanitation and Hygiene (WASH) facilities. This access was already tenuous before the crisis and now lack of access to water has become increasingly deadly".[11]

Tawi-Tawi Province

Tawi-Tawi is the southernmost frontier of the Philippines, bounded by the Sulu Sea on the north and west and Celebes Sea on the south and east. The archipelagic province consists of a group of 307 small islands and islets blessed with abundant natural resources. Tawi-Tawi has a land area of 3,626.55 sq km and a population of 440,276. Tawi-Tawi has 11 municipalities (including Sibutu and Sitangkai), comprising a total of 203 barangays (smallest administrative division in the Philippines and the native term for a village, district, or ward). Tawi-Tawi's population is growing very fast, and over 40% of the inhabitants are below the age of 14.

The whole province of Tawi-Tawi is among the top 20 provinces in the Philippines most vulnerable to climate change impacts and has been assessed as having the lowest adaptive capacity among the more than 70 provinces in the country.[12]

Sitangkai

Sitangkai (4° 40' North, 119° 24' East) is a coastal municipality in the island province of Tawi-Tawi with 9 barangays. It has a land area of 735.46 km^2 which constitutes 20.28% of the province's total area. As of 2020, its population reaches 37,319 representing 8.48% of the total population of the province or 0.85% of the overall BARMM population. As of 2020, Sitangkai has 5,331 households and an average of 5.51 members per household. Much of Sitangkai's low-lying lands have been submerged in seawater. Sitangkai is characterized by high population growth rate (2.41% in 2015 – 2020), meaning that a high share of youth population is present on the island.

Panglima Alari is the largest barangay with a population of 8,417. Together with Datu Baguinda Putih, Imam Saple, and Sitangkai Poblacion, these four barangays comprise more than half of the population of Sitangkai and can be seen in the map as clearly submerged in the sea.[13] The residents in these four barangays live in what are called pondohans (see figures below). Sitangkai also include the island barangay of Sipangkot, which is the second largest barangay.

Figure 3. Pondohan in Sitangkai

Source: MSU-TCTO

Sibutu

Sibutu (4° 51' North, 119° 27' East) is a coastal municipality with 16 barangays, with a land area of 56.54 km^2. Its population as determined by the 2020 Census was 34,243, representing 7.78% of the total population of Tawi-Tawi province or 0.78% of

[8] https://water.org/documents/101/PWSF_MASTER_PPT.pdf, p. 20.
[9] https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2033.pdf, p. 8.
[10] https://water.org/documents/101/PWSF_MASTER_PPT.pdf, p. 21.
[11] https://philippines.unfpa.org/en/publications/gender-inclusion-assessment-gia-impacts-covid-19-pandemic-vulnerable-women-and-girls
[12] Yusuf, Arief Anshory and Herminia Francisco 2010, *Hotspots! Mapping Climate Change Vulnerability in Southeast Asia*. https://books.google.pl/books?hl=pl&lr=&id=A-sXDFLcMR8C&oi=fnd&pg=PA4&dq=tawi+tawi+adaptation+climate+change&ots=rsw6v5mR-H&sig=F4pO6AbMbNmhfeFOo0tkXFEZJpY&redir_esc=y#v=onepage&q&f=false
[13] See https://www.openstreetmap.org/?#map=15/4.6618/119.3949

the overall population of BARMM. From the 2020 Census data, Sibutu has 3,910 households with an average of 6.09 members per household. Sitangkai is also characterized by high population growth rate (2.55% in 2015 – 2020), meaning that a high share of youth population is present on the island. People living in Sibutu Island are mostly boat builders. Some also sell seaweeds, firewood and stones.

Target groups

The target group of the project are the seaweed farming communities of Sitangkai and Sibutu, which are facing increased water stress as well as increased risk on livelihood creation due to climate change. Sibutu and Sitangkai have been assessed as having medium to high vulnerability to climate change because of their barangays' moderate exposures, moderate to high sensitivities, and low to moderate adaptive capacities to cope with the effects of climate change. However, it may be assumed that Sitangkai is highly vulnerable to climate change because the whole municipality is low-lying with no mountains.[14] Also, poor access to electricity and fresh water limits the coping capacity of the communities to the effects of climate change thus lowering overall resilience of the communities.

Seaweed farming

Seaweed farming, among other sea-related production, in targeted communities is one of the main sources of income to the communities. In the project area shallow reefs exceed the area of dry land and the population is surrounded by abundant tropical reef habitats ideal for seaweed aquaculture and other types of sea production.[15]

Ten of the eleven municipalities of Tawi-Tawi produce seaweed, making the province the leading supplier of seaweeds throughout the country with 70% of total production. The province is highly suitable for seaweed farming because it is the least frequented by typhoons resulting to favorable conditions for seaweed cultivation.

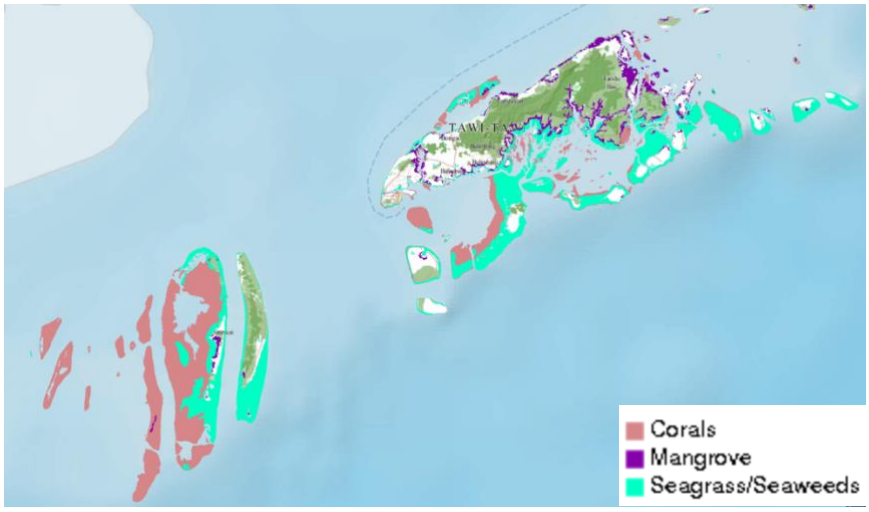


Figure 4. Seaweeds farming areas in Tawi-Tawi

Source: https://www.geoportal.gov.ph/

Despite the extensive farmed seaweed area, production has not increased through the years.[16] This is due to "a host of challenges such as the lack of high-quality seedstocks, "ice-ice" disease infection, epiphyte infestation, and poor farming and post-harvest practices.[17] While seaweed farming in Tawi-Tawi is a major source of livelihood of the community, there seems to be few innovations and introduced adaptive measures to improve seaweed cultivation and postharvest practices.[18] Therefore work on strain selection and improvement in the seaweed culture system has been undertaken to produce fast growing, disease resistant, resilient to environmental variations and high carrageenan yield and quality seed stocks for each farming season.[19]

Sitangkai and Sibutu are the top seaweed producing municipalities of the province. Many seaweed farmers in the two municipalities use to an equal degree either their personal funds or credit from traders to finance their farm implements. Because of this arrangement, traders monopolize the market and dictate seaweed prices.[20] Based on an interview with an

[14] Burias et. al. (2021).
[15] RETS VCA study, p. 10.
[16] Bugtong et. al. (2021), p.3.
[17] Cited in Bugtong et. Al. (2021), p.3.
[18] Bugtong et. Al. (2021), p.4.
[19] Cited in Bugtong et. al. (2021), p.4
[20] Bugtong et. al. (2021).

official from the Tawi-Tawi Provincial office of MAFAR, seaweed farmers are price-takers. The only way they could get a good price is when they could sell a good quantity of raw, dried seaweed (RDS). Thus, capital assistance is very much needed to enhance the farmer's capacity to increase production and improve the quality of RDS.[21] Majority of seaweed farmers also need funds to buy seed-stocks or cultivars for the next cropping cycle from fellow farmers or traders.

Tawi-Tawi is the largest producer of seaweeds in BARMM but ranks only sixth in terms of value. This reflects the lack of processing capabilities in which energy and water are vital inputs. [22] Energy and clean water are vital inputs to the processing of seaweeds to enhance its quality. Electricity is needed to have quality seedlings and better post-harvest facilities, to improve the price of raw dried seaweeds, and much more to process and refine seaweeds into higher value quality products as carrageenan. Increasing income opportunities and improving economic stability of the seaweed farming communities will increase their resilience to climate change.

Electricity access in the project area

Sitangkai, and Sibutu are each served by National Power Corporation – Small Power Utilities Group (NPC-SPUG). Tawi-Tawi remains among the poorest, least electrified provinces in the country. Household electrification rate for the whole province is just above 20%, and even those connected to the SPUG's diesel mini-grids receive only between 12 and 16 hours of electricity service daily. The problem of low electrification in the project area is targeted by the RETS and I-PURE projects, which are baseline to this project.

Water access in the project area

With the whole BARMM region having the lowest water supply coverage in the country and majority of the population having only level 1 access, as mentioned above, Tawi-Tawi is also deemed as among the provinces with poor water access.

Water supply surveys in selected barangays in the two islands, 8 of 16 barangays in Sibubtu and 4 of 9 barangays in Sitangkai were conducted in 2020/2021 within the RETS project. Each of these barangays are served by single water supply systems that are owned by either the barangay Local Government Unit (LGU), homeowners' association, or a private entity. The four barangays surveyed in Sitangkai are served by barangay LGU owned water supply systems. 10 of the 12 barangays surveyed report a level 2 water supply system, while two a level 1 or level 3 water supply. Two barangay water supply systems surveyed in Sibutu and one in Sitangkai are not operational. In any case, the water supply systems consist of communal wells, a shallow well pump, concrete water tank, groundwater boreholes, but without any water treatment facility or communal faucets and pipes, and evidently sub-standard and dilapidated. All report inadequate funds for operation and maintenance as well as needed improvements, particularly those that are currently non-operational.

Based on the official definitions of water supply service levels shown below, the barangay water supply systems in Sitangkai and Sibutu would fall under level 1 and not level 2. Also, by definition, barangay operated water supply systems fall under level 1.[23]

All respondents identified rainwater as the alternative source of water. Particularly in the pondohans, households rely heavily on rainwater harvesting, and potable drinking water and bottled water are imported from other islands (which is very costly up to ~5USD per m^3).

NEDA Board Resolution No. 12, Series 1995, defines the levels for water supply service in the country as:

- Level 1 (point source) – a protected well or a developed spring with an outlet but without a distribution system as it is generally adaptable for rural areas where the houses are thinly scattered serving an average of 15 households with people having to fetch water from up to 250 meters distance
- Level 2 (communal faucet system or stand post) – a piped system with communal faucets usually serving 4-6 households within 25 meters distance[24]
- Level 3 (waterworks system) – a fully reticulated system with individual house connections based on daily water demand of more than 100 liters per person.

[21] Bugtong et. al. (2021), p. 12, 13.

[22] RETS project concept note.

[23] "BWSAs (Barangay Water Supply Associations) operate Level I facilities (mostly wells with handpumps) while Level II piped supplies are operated by RWSAs (Regional Water Supply Associations) and cooperatives." (PWSSR, p. xv.)

[24] Official definition of Level 2 water supply facility/service (communal faucet system or standposts): A water supply facility composed of a source, a reservoir, a piped distribution network with adequate treatment facility, and communal faucets. Usually, one faucet serves 4- 6 households. Generally suitable for rural and urban fringe areas where houses are clustered densely to justify a simple piped system. The definition was modified with the inclusion of the underlined phrase 'with adequate treatment' to emphasize that source of water supply has passed the Philippine National Standards for Drinking Water. (Source: https://psa.gov.ph/content/level-ii-water-supply-facilityservice-communal-faucet-system-or-standposts-1)

Figure 5. Communal well in Taungoh, Sibutu

Source: RETS project

Figure 6. Communal well in Tomageng, Sitangkai

Source: RETS

Gender issues[25]

Seaweed farming is a family enterprise with family members, both immediate and extended, helping out during the pre-

[25] Based on Bugtong et. al. (2021), pp.7-8.

farming preparation, farming, harvesting, and drying. Children, including those of their neighbors, help, which makes them miss school. Women are involved in all stages of the cropping cycle and post-harvest processing—from prepping and tying the seedlings to the lines in the farm, setting up the lines, to maintaining the growing seaweeds, harvesting, drying, and packing. In addition, women also sell fresh seaweeds in the markets. However, women farmers are not compensated for their contribution to the farm because their labor inputs are not considered as part of the capital investment. In addition, women farmers are not considered the main players of the industry because of their limited knowledge, lack of skills, training and lower level of education compared to their male counterparts. They learned to farm through their own initiative and hands-on activities. The male farmers attribute their success in farming to the skills and experience gained from farming for a long time. Skilled and experienced farmers were more likely able to address problems such as ice-ice infection, epiphyte infestation or extreme weather conditions. It is important to note that a good education would improve the capacity of seaweed farmers to think critically and manage their farms effectively.

Climate hazards and future climate trends

Climate related hazards

The Philippines faces some of the highest disaster risk levels in the world, ranking joint 38th out of 191 countries in the INFORM 2019 Risk Index[26]. The country is especially exposed to tropical cyclones, ranking 2nd highest in terms of risk. Flooding is also a considerable risk (ranked 29th) and a major contributor to the Philippines' position on the INFORM index. Tightly linked to these risks is the threat of landslides, which is significant, particularly in the country's northern regions. The risks associated with drought, however, are less pronounced (ranked 68th). In terms of 'coping capacity', the Philippines ranks joint 88th. The following climate-related natural hazards have been analyzed in the context of the project site (based on the World Bank Climate Change Knowledge Portal[27] and National Drought Plan for the Philippines[28]):

(a) **Temperature and heatwaves** – the Philippines experienced a rise of 0.62°C in annual average mean temperature between 1958-2014 and a significant increase in the number of hot days and warm nights throughout the country between 1960-2003 (trends are similar to those experienced across the Pacific region in general), with significantly higher increase in the mean temperatures in southern part of the country. Over the same period there is also an increasing significant trend in the number of hot days (maximum temperature above 99th percentile) and a decreasing significant trend in the number of cold nights relative to normal values for 1971-2000.

(b) **Sea surface temperatures** from 1982 to 2017, based on NOAA's data, have been increasing since 1982 at an average rate of 0.20°C per decade or an average absolute increase of 0.65°C up to 2017[29].

(c) **Precipitation and droughts** - analysis of rainfall records in the period of 1951 to 1992 shows negative rainfall amount trends in Mindanao, Visayas, and Eastern Luzon. There is also a decreasing trend in rainfall associated with the southwest monsoon (SWM) in the past 50 years and an increasing trend in the number of "no rain" days suggesting a longer dry period during the SWM in recent decades over western Philippines. The occurrence of drought is heavily influenced by the El Nino Southern Oscillation (ENSO) and its warm and dry phase, El Nino, the southern parts of the country (Mindanao) are particularly affected. There have been 11 droughts recorded since 1968 (on average every 4-5 years). The 2015-2016 drought, which caused damage across 16 of the Philippines 18 regions (85% of the country), was driven by the most severe El Nino event ever recorded.

(d) Sea level rise – according to the University of the Philippines-Marine Science Institute, sea level rise in the Philippines is three to four times faster than the global average rate and impacts of sea-level rise such as coastal flooding, coastal erosion and the salinization of aquifers are already felt, there are numerous compounding local factors. Rate of sea-level rise experienced in Manila Bay and Visayas in recent decades is at 15mm per year (between 1960 and 2012).

(e) **Cyclones and floods** - the Philippines is highly exposed to flooding, the consequence of severe cyclones and heavy rainfall. The Philippines is one of the most cyclone-prone countries in the world, lying on what is often described as the 'typhoon belt'. Approximately 19–20 cyclones enter the Philippine Area of Responsibility annually, with 7–9 reaching landfall. The number of typhoons making landfall around the Leyte Island region of the country has steadily increased over the last 70 years.

Future trends

According to the latest Philippine Atmospheric, Geophysical and Astronomical Services Administration Climate Change projections and World Bank Group's Climate Change Knowledge Portal (CCKP), the Philippines will experience:

[26] https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-Risk

[27] Based on the Coupled Model Inter-comparison Project Phase 5 (CMIP5) models, utilized within the Fifth Assessment Report (AR5)

[28] https://knowledge.unccd.int/sites/default/files/country_profile_documents/1%2520FINAL_NDP_Philippines.pdf

[29] Geronimo, RC (2018). Projected Climate Change Impacts on Philippine Marine Fish Distributions. Department of Agriculture – Bureau of Fisheries and Aquatic Resources.

(a) **Temperature and heatwaves** - the Philippines will experience a trend of consistent warming, with more significant warming occurring towards the end of the century (from 0.8°C to 3.1°C depending on the representative pathway). Under all emissions pathways projections, the probability of experiencing a heat wave increases dramatically by 2080–2099, for Mindanao in the south, particularly large increases in heatwave probability are projected, with potential for year-long heatwaves by 2050.

(b) **Sea surface temperature** – global projections show different trajectories temperature trends within the Philippines' seas up to 2100 depending on how strongly global greenhouse gas emissions are mitigated ranging from 0.7°C to 3.1°C increase in mean sea surface temperature. More detailed regional models provide estimates that the Philippines' seas are projected to warm by more than 3.5°C by 2100[30].

(c) **Precipitation and droughts -** considerable uncertainty surrounds projections of local long-term future precipitation trends, but some trends are evident, that is increasing trends in annual rainfall and seasonal rainfall in many parts of the country associated with extreme rainfall events. The intensity of sub-daily extreme rainfall events appears to be increasing with temperature.

(d) **Sea level rise** – the sea-level is projected to increase by 50 cm by mid-century and by up to 1.33 m by 2100 under the highest emissions scenario (SSP5-8.5). Furthermore, 16.9% of the Philippines' islands are projected to become submerged under extreme scenarios of sea-level rise (6m).

(e) **Cyclones and Floods** minimal increase in the frequency of very strong tropical cyclones exceeding 170 km/h; and Typhoons also appear to have greater intensity - there is a likelihood that high intensity events will become more frequent, and available models suggest that expected annual damages could increase by up to 35% by 2050.

Climate change impacts and natural resources

The Philippines ranked 4th among the countries most affected by extreme weather events in 2000-2019 (Long-term Global Climate Risk Index)[31], in this period the country experienced a total of 317 weather-related events, the highest among the most affected countries.

According to the WorldBank[32], the Philippines, is becoming increasingly vulnerable to **water scarcity**, a consequence of rising population and increased demands from household and industrial consumption. Climate change could impact hydrological processes, having significant effects on numerous aspects of water resources, including streamflow, domestic water supply, irrigation, aquifer depth and recharge as well as water quality such as saline intrusion. Changed rainfall patterns may lead to water shortages due to the inability to store excess water for use in the dry season. In addition, intense rainfall events may not recharge groundwater at the rate experienced when rainfall is spread more evenly across the season. Finally, lower than average rainfall during the dry season may also affect soil porosity and vegetation condition leading to reduced infiltration rates and groundwater recharge (Miller, Alexander, & Jovanovic, 2009).[33]

Observed **sea level rise** is significantly higher than the global average and puts at risk 60% of LGUs covering 64 coastal provinces, 822 coastal municipalities, 25 major coastal cities, and an estimated 13.6 million Filipinos that would need relocation.[34] Impacts of sea-level rise such as coastal flooding, coastal erosion and the salinization of aquifers are already felt in the country. Additionally ground compaction due to excessive groundwater withdrawal adds to the problem.

Sea surface temperature increase results in lower oxygen levels and ocean acidification. In the Philippines, a decline of around 9% of fisheries GDP and coral bleaching was observed owing to rising ocean temperatures. Seaweed survival, growth, and reproduction are known to vary with numerous climatically sensitive environmental variables including temperature, salinity, wave heights, pH, and carbon dioxide concentration, which are influenced by climate change. Rising sea temperature has a negative effect on seaweed productivity through reduced spore production, reduced germination, and growth[35].

Specific impacts in the project area

Tawi-Tawi is a province composed of small and low-lying island communities where many of its residence live along the coast because of its easy accessibility to the sea. These coastal communities are highly dependent on the ocean for food and livelihood. The islands are surrounded by diverse coastal ecosystems like seagrass beds, mangrove forest and coral reefs. However, the low-lying setting of the islands surrounded by water and relatively exposed to predominant wind makes them

[30] Geronimo, RC (2018), ibid.

[31] https://www.preventionweb.net/news/highlights-ipcc-ar6-wg1-and-its-relevance-philippines

[32] Climate Risk Country Profile: Philippines (2021): The World Bank Group and the Asian Development Bank

[33] Cruz, R. V. O., et. al. (2017). 2017 Philippine Climate Change Assessment: Impacts, Vulnerabilities and Adaptation. The Oscar M. Lopez Center for Climate Change Adaptation and Disaster Risk Management Foundation, Inc. and Climate Change Commission, p.2 and 8. https://climate.gov.ph/files/PhilCCA-WG2.pdf

[34] PDP, p. 3-17. CCC 2018. *Climate Change and the Philippines: Executive Brief*.

[35] Harley, Christopher & Anderson, Kathryn & Demes, Kyle & Jorve, Jennifer & Kordas, Rebecca & Coyle, Theraesa & Graham, Michael. (2012). Effects Of Climate Change On Global Seaweed Communities. Journal of Phycology. 48. 1064-1078. 10.1111/j.1529-8817.2012.01224.x.

susceptible to storm surge and sea level rise. In addition, Tawi-Tawi is located in a region where the rate of sea level rise is 8mm/year based on the map of rates of sea level changes in the Philippines between 1993 and 2009.[36]

Particularly in the project area, **climate change will increasingly reduce the already scarce water resources in these areas.** The climate change threats to water resources include increased intensity and frequency of storm (La Nina) and drought (El Nino); variation in steam flow and groundwater recharge, affecting water quality and seasonal water availability; higher temperature affecting water quality (such as eutrophication); and sea level rise causing saltwater intrusion into surface and ground water, affecting the amount and quality of water supplies[37], not to mention increased vulnerability of homes to inundation.

Based on the climate vulnerability assessment of the capital town of Bongao Island (Tawi-Tawi) to sea level rise, storm surge and wave impacts, the islands of Tawi-Tawi have high sensitivity to these climate impacts depending on population, seagrass (seaweeds) and coral cover, and presence of mangrove forests.[38]

Unpredictable rains and longer dry seasons have been observed also in Tawi-Tawi during the last 3 to 4 years. This could also impact ground water supply and quality especially as these climate phenomena are expected to persist. Rainwater harvesting, which is a main practice to have water supply is obviously also affected. Also, continuous underground water extraction in Sibutu could lead to salt-water intrusion and collapse of infrastructures.

Vulnerability of the project area

Tawi-Tawi is among the most vulnerable to climate change impacts in the country and has the lowest adaptive capacity, and this is aggravated by having the lowest electricity and water access in the Philippines (with the whole BARMM having the lowest water supply and sanitation coverage).

Communities in Sibutu and Sitangkai have been assessed as having medium to high vulnerability to climate change because of their barangays' moderate exposures, moderate to high sensitivities, and low to moderate adaptive capacities. However, it may be assumed that Sitangkai is highly vulnerable to climate change because the whole municipality is low-lying with no mountains.[39]

Poor water access is a result of existing but substandard and poorly operated and maintained Level II (communal) water supply systems in most Sibutu and Sitangkai barangays, some of which are not operational. Many households in these 2 island municipalities also rely on rainwater harvesting. In Sitangkai, potable water is imported from Sibutu.

Tawi-Tawi is the biggest seaweed producing province in BARMM, which is the highest seaweed producing region in the country. Seaweed farming is a major source of livelihood of the communities in the province, and Sitangkai and Sibutu are the top seaweed producing municipalities of the province. Increasing sea water temperature negatively impacts seaweed productivity, decreasing yields and ultimately reducing communities' income.

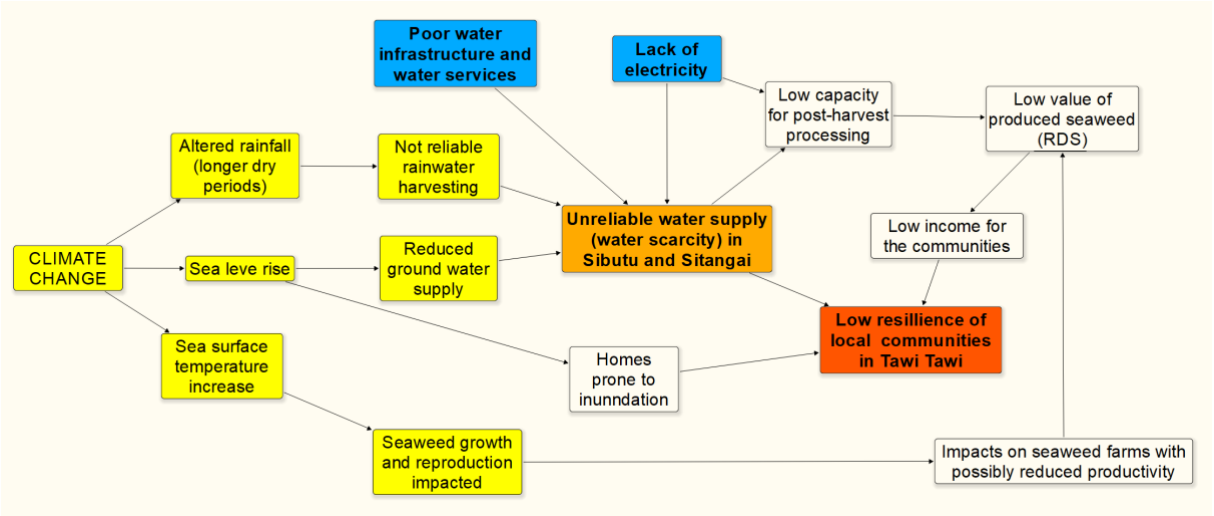


Figure 7. Schematic diagram of climate adaptation problem addressed by the project. Identified climate change impacts (yellow), vulnerable infrastructure (blue), impact on communities (orange/red).

[36] Burias, Dahlia P. et. al. (2021), "Climate change vulnerability assessment of islands in Tawi-Tawi, Southwestern Philippines" (unpublished).
[37] https://www.wetlands.ph/wp-content/uploads/2019/03/NWRB_WRM-in-the-Phil-Status-Challenges-and-Opportunities.pdf. A Study conducted by the WRI predicts the Philippines will experience a "high" degree of water shortage by 2040 (CCC 2018. *Climate Change and the Philippines: Executive Brief*).
[38] https://www.researchgate.net/publication/267293548_Vulnerability_assessment_of_an_island_in_Southern_Philippines_to_climate_change
[39] Burias et. al. (2021).

Source: own elaboration

Short introduction of the proposed project interventions

The proposed project aims to support communities in Tawi-Tawi in securing climate-resilient water access. The seaweed farming communities already face water insecurity, which will only get worse due to climate change. **The project will seek to increase adaptive capacity of the communities in Sibutu and Sitangkai, through provision of access to water infrastructure and services.** Also, it will strengthen livelihoods and sources of income of vulnerable seaweeds producing communities in Sibutu and Sitangkai by stimulating manufacturing of better-quality seaweeds. Finally, project activities will build awareness and ownership of adaptation and climate risk reduction processes within local communities and LGUs in Sibutu and Sitangkai, as well as in the wider region.

The main set of activities will be focused on provision of resilient water infrastructure (including new desalination plants and upgraded existing infrastructure) and water services in the project area, accompanied by relevant studies and capacity building targeted at local communities.

Improvement of water system (including installation of desalination plants) is the main infrastructure solution addressing climate change impacts being proposed by the project for the island municipalities of Sitangkai and Sibutu. The goal is to build resilient water supply, currently at stake due to rising sea level (intrusion of seawater into ground water) and unpredictable and variable rainfall - all resulting from changing climate patterns. These climate impacts affect the amount and quality of available water supply in the two islands and increase the cost of water to the communities. In parallel, the project will rehabilitate the existing substandard (not conforming with national standards) communal wells and upgrade them to level 2 water supply systems. These will complement the water supply from desalination plants, while ground water reserves remain available. The desalination plants will be powered by the already installed RE mini-grids (RETS project). The availability of resilient water supply will meet the basic needs of seaweeds farming communities in Sitangkai and Sibutu.

Additionally, the project activities will focus on capturing opportunity of increasing productivity of seaweed farms and quality of RDS, thanks to increased availability of freshwater and electricity. Working with local communities the project will focus on developing/improving seaweed production strategies in relation to climate change impacts, including predicted environmental variability and utilising available water resources and electricity. This in turn will strengthen livelihoods and sources of income of vulnerable seaweeds producing communities in Tawi-Tawi.

Investment component of the project will be accompanied by the awareness and capacity building activities at local level in Tawi-Tawi. Local governments and communities will be trained, and relevant plans prepared to strengthen awareness and ownership of adaptation and climate risk reduction processes within local communities in Tawi-Tawi. Knowledge and lessons learnt will be documented in order facilitate knowledge sharing and scaling up of the activities to other parts of Tawi-Tawi/Philippines. The project will also address gender issues and youth engagement with targeted activities.

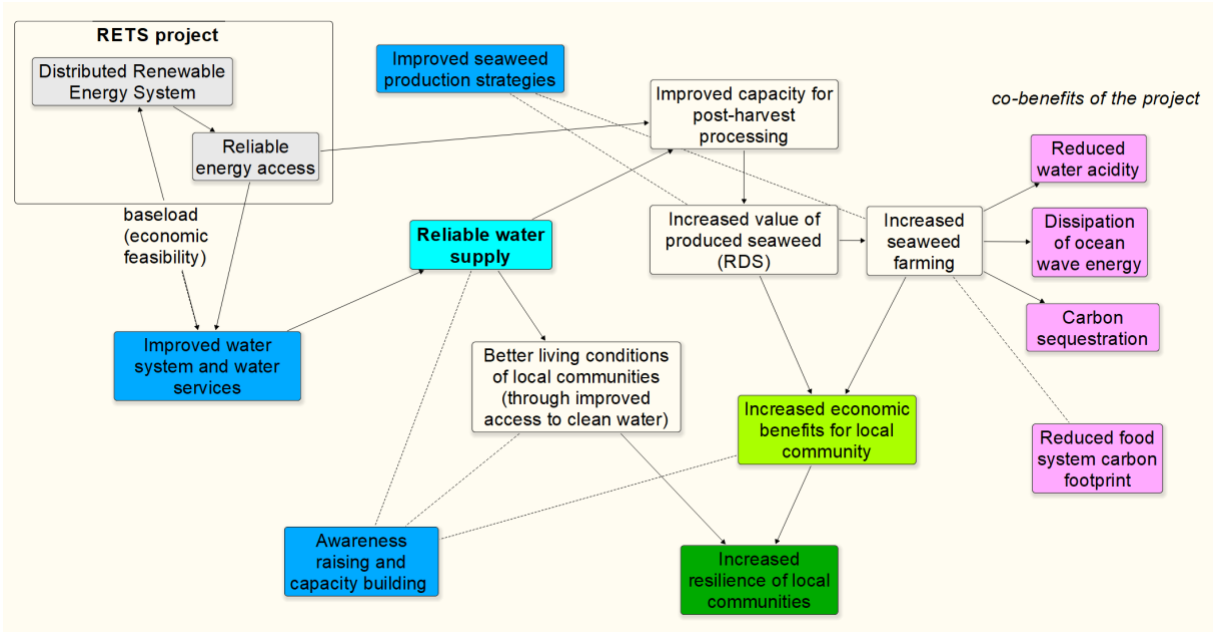


Figure 8. Proposed project intervention (dark blue) and its impact on local communities (short term impacts – light green, long-term result – dark green) and climate/habitats (lilac).

Source: own elaboration

The increased productivity and expected higher demand for high quality seaweeds will lead to increased seaweeds production in the project area. This in turn will lead to maximization of seaweeds farming contribution to climate adaptation with climate mitigation co-benefits. Additionally, the project will strengthen the ecosystem services provided by seaweeds and its value for food and nutrition and as a primary source of income and livelihood for the target beneficiaries. Seaweed potential contributions to climate change mitigation and adaptation are also enhanced with improved quality and higher production.[40]

RETS project

MINDA and UNIDO, together with Tawi-Tawi Electric Cooperative, Inc (TAWELCO), local governments and BARMM government are implementing the Renewable Energy Technology to Increase Value Added of Seaweeds in Tawi-Tawi (RETS) project in Tawi-Tawi with co-funding from the European Union's Access to Sustainable Energy Programme (EU-ASEP) and the support of the Department of Energy (DOE) and the National Electrification Administration (NEA).

The project area covers the municipalities of Sitangkai (Barangay Tongmageng) and Sibutu (Barangay Taungoh) in Tawi-Tawi[41], part of BARMM. The RETS project aims to increase and extend the availability of electricity service in these island municipalities that are home to about 15,000 seaweed farmers, through the renewable energy hybridization of the island grids in the municipalities of Sitangkai and Sibutu.

The RETS project has the following Outputs:

- Output 1. RE-hybrid systems are implemented in Sitangkai and Sibutu; Feasible decentralized RE systems for the seaweed value chain are developed in Panglima Sugala and Tandubas.
- Output 2. Appropriate water supply systems are assessed and designed integral to the RE hybrid systems.
- Output 3. The plans, programs, and projects of BFAR to increase production of higher quality raw dried seaweeds (RDS) are facilitated.
- Output 4. The plans, programs, and projects of the local government units (LGUs) to improve the delivery of economic and community social and welfare services are facilitated.

The local farming communities also lack access to adequate water supply. The results of the RETS project include provision of energy access to an additional 5,000 households, extend operation to 24 hours as well as the development of feasibility study for water supply systems. The following outputs of the RETS project constitute a baseline for the proposed adaptation project:

RETS project output	Status of the activity	Relevance for the Adaptation project
RE-hybrid systems are implemented in Sitangkai and Sibutu	In 2021 ongoing work to deploy 1004 kWp PV + 640 kW diesel gen-set + 824 kWh Li-ion storage in Sitangkai and 648 kWp PV + 480 kW diesel gen-set + 612 kWh Li-ion storage in Sibutu. Planned operation start in 2022.	The deployed electricity generation sources will be upgraded and utilised as a primary source of energy for the proposed desalination plants and rehabilitated communal wells. The desalination plants will provide a baseload for the upgraded RETS-deployed infrastructure
Appropriate water supply systems are assessed and designed integral to the RE hybrid systems	The water feasibility study is under development by local consultants. The expected delivery date is June 2022.	The feasibility study will provide crucial input to the adaptation project – the findings of the study will inform the detailed design of the system to be funded by the Adaptation Fund.

[40] Duarte, Carlos Mp, et. al. (2017), "Can seaweed farming play a role in climate change mitigation and adaptation," Frontiers in Marine Science, vol. 4, article 100, 12 April. https://www.frontiersin.org/articles/10.3389/fmars.2017.00100/full.

[41] Also Panglima Sugala and Tandubas in Tawi-Tawi are targeted areas of the RETS project

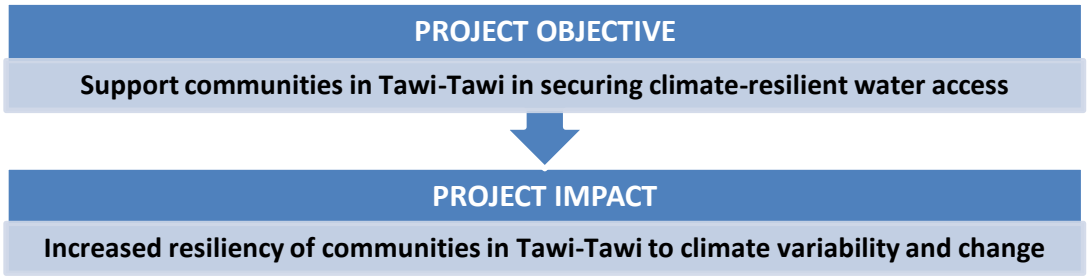
Figure 9. Photovoltaic plants and diesel generators deployed by the RETS project in Sibutu and Sitangkai, as of October 2021.

Through improved access to energy services, the RETS project also contributes towards increasing the production of raw dried seaweeds, as electricity is utilized for powering of equipment for processing. This furthermore supports the increase in income and employment generation potential through the availability of electricity services and use of renewable energy technologies. Proposed adaptation project will build on that and complement this activity through the improved availability of fresh water.

The RETS project's planned end date is December 2022.

Project / Programme Objectives:

General and specific objectives



Specific project objectives

1. Increased adaptive capacity through access to resilient water infrastructure and services
2. Strengthened livelihoods and sources of income of vulnerable seaweeds producing communities in Tawi-Tawi
3. Strengthened awareness and ownership of adaptation and climate risk reduction processes within local communities in Tawi-Tawi

Alignment of Objectives with AF Strategic results Framework

Project output	Project outcome	Desired AF-RF outcome
Water infrastructure assets and services strengthened in response to climate change impacts, including variability	Increased adaptive capacity of water access infrastructure and services	Outcome 4: Increased adaptive capacity within relevant development sector services and infrastructure assets
Seaweed production strategies strengthened in relation to climate change impacts, including variability	Strengthened livelihoods and sources of income of vulnerable seaweeds	Outcome 6: Diversified and strengthened livelihoods and

	producing communities in Tawi-Tawi, new jobs created	sources of income for vulnerable people in targeted areas
Local governments and communities trained and relevant plans prepared	Strengthened awareness and ownership of adaptation and climate risk reduction processes within local communities in Tawi-Tawi	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level

Project / Programme Components and Financing:

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US$)
1. Deployment of a resilient water supply systems integrated with upgraded RE infrastructure in Tawi-Tawi	Water infrastructure assets and services strengthened in response to climate change impacts, including sea level rise and rainfall variability	Increased adaptive capacity of water access infrastructure and services	3,850,000
2. Upgrading of seaweeds industry in Tawi-Tawi	Seaweed production strategies strengthened in relation to climate change impacts, including variability	Strengthened livelihoods and sources of income of vulnerable seaweeds producing communities in Tawi-Tawi, new jobs created	300,000
3. Awareness and capacity building at local level in Tawi-Tawi	Local governments and communities trained and relevant plans prepared	Strengthened awareness and ownership of adaptation and climate risk reduction processes within local communities in Tawi-Tawi.	400,000
4. Project scaling up	Documentation and plans for project scale up in the Philippines prepared	Scaling up of project outcomes facilitated	87,800
5. Project/Programme Execution cost			397,816
6. Total Project/Programme Cost			5,035,616
7. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)			428,027
Amount of Financing Requested			**5,463,643**

Projected Calendar:

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2023
Mid-term Review (if planned)	October 2024
Project/Programme Closing	June 2026
Terminal Evaluation	October 2026

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

The project has three components, with main component focused on adaptation investment, and other components focusing on soft activities aimed at securing project sustainability.

Component 1. Deployment of a resilient water supply systems integrated with upgraded RE infrastructure in Tawi-Tawi

The two islands (Sitangkai and Sibutu) in the Tawi-Tawi province currently lack a reliable water supply, and the situation is going to get worse due to climate change impacts. The local communities on the island (mainly seaweed farmers) are facing a problem of increasing water scarcity. This directly impacts their livelihoods (shortage of fresh water for drinking and hygiene) and indirectly through a limited availability of water for processing of seaweeds, resulting in lower income. This issue has been highlighted during consultations with local stakeholders – at the local level (field survey within barangays done within the RETS project).

Rising sea-level makes large-scale development of standard groundwater-based water distribution system not feasible due to increasing salinity (due to increasing seawater intrusion). Therefore, this project proposes to address this issue through providing small-scale desalination plants, powered with decentralized renewable energy (instead of grid powered groundwater wells), as a source of fresh water to water distribution system.

Therefore, the main scope of Component 1 of the project is to deploy a climate resilient water system consisting of:

- Desalination plants (planned 2 - 4 plants, with a total capacity of 200 m^3/day).
- Additional PV capacity for powering of desalination plants.
- Renovated/upgraded water wells and water distribution system (50 – 78 wells).

The number, capacity and precise location of the desalination plants, additional PV capacity, as well as the scope of renovation of existing water system will be defined based on the water supply feasibility study, which will be completed within the RETS project by June 2022. Details of the study are presented in the Annex II. The results of the study will be presented at the fully developed proposal stage.

The two island municipalities do not have a water distribution system and with limited access to electricity (prior to the completion of the RETS project, electricity is provided by NPC-SPUG diesel gensets and TAWELCO distribution systems and is available 12-16 hours a day). These municipalities currently rely on rainwater harvesting and groundwater pumping in sub-standard communal wells[42].

The hybrid RE power plant (deployed by the RETS project, operational by the end of 2021) in Sibutu is located in Barangay Taungoh, which is one of the coastal barangays on the eastern side of Sibutu Island. The desalination plant would be sited and designed such that it serves Barangay Taungoh and other nearby barangays along the eastern coast of the island. The upgrading of the communal water supply systems that serve these barangays will also be prioritized.

The hybrid RE power plant (deployed by the RETS project, operational by the end of 2021) in Sitangkai is located in Barangay Tongmageng, which is one of the coastal barangays along the western coast of Sitangkai. Similarly, the desalination plant will be sited and designed to serve Barangay Tongmageng in the first place and then nearby barangays. The upgrading of the communal water supply systems in Tongmageng and these other barangays will also be prioritized.

The total capacity of the RE power plants (1.6 MWp), deployed by the RETS project has been designed to serve current and future needs of the communities, but without enough power reserve to serve desalination plants. The desalination plants typically require electricity supply of 2.4 – 4 kWh per cubic meter of water produced[43], therefore an estimated total PV capacity of 160 – 200 kWp would be required[44]. This additional PVs would be added to the existing power plants, utilising the infrastructure already on the ground.

In the meantime, the barangays in Sibutu and Sitangkai have tried to develop communal wells tapping the ground water resource in the islands. However, these substandard communal wells are either dilapidated and poorly maintained or not operational due to lack of funds. The proposed project will rehabilitate these communal wells to conform to national standards

[42] not conforming to Philippine National Standard for Drinking Water of 2017

[43] Voutchkov, Nikolay. 2013. Desalination Engineering Planning and Design. McGraw-Hill.

[44] PV output from 1kWp of installed PV system in the project area is ca. 1.5 MWh/year (https://globalsolaratlas.info/)

of Level 1 systems[45], and if possible, upgrade them to level 2 systems[46]. In addition, in Sitangkai, the project will look to improve the water supply systems in the pondohans (in barangays Panglima Alari, Datu Baguinda Putih, Imam Saple, and Sitangkai Poblacion), which rely on rainwater harvesting and imported potable water from Sibutu.

The desalination plants and communal wells will be integrated to the hybrid RE mini-grids completed within the RETS project (with expanded capacity to cover desalination plants power demand). As many residents of the two islands rely on rainwater harvesting, particularly those in four barangays in Sitangkai living in pondohans, the project will improve this rainwater harvesting system so they are more efficient and distribute more systems to complement the water supply provided by the desalination plants and communal wells.

The detailed design of the water system, including desalination plants, as well as operational model and ownership will be defined based on the results of the water system feasibility study conducted within the RETS project, due in June 2022.

The activities and corresponding outputs included in this main component are:

Component 1. Deployment of a resilient water supply systems integrated with existing RE infrastructure in Tawi-Tawi	
Activities	**Expected Outputs**
1. Development of pilot desalination projects in Sitangkai and Sibutu, targeting seaweed farming communities	Desalination plants are installed in selected barangays in Sitangkai and Sibutu and complement level 2 water supply systems
2. Rehabilitation of existing level 1 water supply systems to level 2	Operational and non-operational level 1 systems are retrofitted and upgraded to level 2 according to accepted national technical standards
3. Integration with the hybrid RE systems, extension of PV capacity to power the desalination plants	The hybrid RE systems are upgraded and expanded to accommodate the power demand of desalination plants.
4. Improving and increasing installations of rainwater harvesting systems	Existing rainwater harvesting systems are improved and additional systems are installed

Component 2. Upgrading of seaweeds industry in Tawi-Tawi

Seaweed farming is one of the major sources of income for the communities in Sitangkai and Sibutu. Increasing disposable income for the communities through increased value of their produced RDS contributes to resilience strengthening of the people. Additionally, higher income allows for better nutrition, providing health benefits. The current practice in the two islands currently is limited to seaweed farming and drying. As consultations with local stakeholders show, this is mainly because communities are limited by lack of capital and to lack of access to electricity and water. To produce better quality product (with higher market price) the freshwater requirement is 20 kg of freshwater for every kg of seaweeds[47].

With limited fresh water supply in Tawi-Tawi, processors of dried seaweed find it hard to sustain production even with the electricity supply already provided by the infrastructure established by the RETS project. Therefore, the availability of freshwater through the proposed desalination system will be crucial in ensuring a sustainable seaweed value chain operation. This way the project can help poor communities capitalize on the water-energy-food nexus to drive their local economic growth and contribute to respond to climate challenges.

Project activities in this component will therefore focus on utilizing deployed freshwater and electricity resources for stimulating production of high-quality products. Simultaneously, the project will explore opportunities of strengthening seaweed farming communities through better organization of farmers (farmers cooperatives), based on previous experiences in this area[48].Project activities will also address gender issues through targeted trainings and support directed to women engaged in the production of the RDS, also include youth-led enterprises and NGOs engaged in seaweed value chain.

This component will include wider outreach activities to engage other seaweed farming communities in Tawi-Tawi, BARMM and other provinces, including study tours, site visits focused on good practice transfer and knowledge exchange for seaweed farming and processing.

The activities and corresponding outputs included in this main component are:

[45] Level 1 is a protected well with an outlet but without a distribution system, serving av. 15 households up to 250 m distance

[46] Level 2 is a piped system with communal faucets serving 4-6 households within 25 meters distance

[47] Based on initial results from water feasibility study (RETS project)

[48] USAID, "Mindanao Water-Energy Nexus Study Final Report," Building low emission alternatives to develop economic resilience and sustainability (B-LEADERS) Project, 2017

Component 2. Upgrading of seaweeds industry in Tawi-Tawi	
Activities	**Expected Outputs**
1. Study and implementation of adaptive seaweeds production and farming systems (including sea-based seaweeds nurseries and dryers) to improve the quality of RDS. The study will also identify gender gaps and ways to address them and identify options for youth engagement in the seaweed production.	Adaptive and sustainable (powered by RE) seaweeds production systems are identified, their application to Sibutu and Sitangkai are studied, and feasible applications are implemented for higher value final product. Gender and youth issues identified and relevant measures to address them prepared.
2. Explore opportunities for implementation of value-addition processes for seaweeds (incl. centralised, cooperative processing) to increase livelihood opportunities of seaweed farming communities and address gender issues and engage youth.	Feasibility of processing centralisation is assessed; higher value, semi-processed or final seaweeds products are produced by communities; gender issues mainstreamed in seaweed processing and youth consulted and engaged.
3. Disseminate knowledge to other seaweed producing communities in the region (BARMM) and elsewhere (Regions IV-B MIMAROPA and IX Zamboanga Peninsula)	Dissemination workshops, study tours, site visits are conducted for targeted audience, including representatives of seaweed farming communities or community cooperatives. These activities will be gender responsive – organized in a way that both women and men can attend. Press releases and press kits are prepared and circulated on national and regional mass media through the national and regional offices of PIA (Public Information Agency).

Component 3. Awareness and capacity building at local level in Tawi-Tawi

The development of the desalination plants and rehabilitation and upgrade of the communal wells will be accompanied by awareness raising on the value and applicability of different water supply systems and capacity building on the design, installation, and operation and maintenance of these systems. This component is aimed at sustaining the outcomes of the project.

Proposed activities will focus on building capacity of local government units (Sibutu and Sitangkai) to fully utilize the deployed infrastructure for the benefit of local communities with focus on equitable access to water of all groups, including specific women's needs. This will include operational planning and trainings in the maintenance and servicing of the systems. Additionally, seaweed farmers will be capacitated and their awareness of climate change impacts and adaptation measures to strengthen resilience will we targeted.

Key issues of resilient water and energy planning and management in island communities in the context of climate change will also be priorities in local planning in the LGUs. This will specifically focus on adaptive water management, use of renewables, energy storage, gender mainstreaming.

In this context climate-smart investment planning will be introduced in the LGUs, which will help the local governments manage their investment pipeline considering all relevant climate change impacts, in turn prioritizing most relevant alternatives for the investment in the context of climate change adaptation. This will enable Local Governments to also seek potential partnerships with private operators and/or investors.

Lessons learned in the project will be documented and disseminated through knowledge exchange activities including media releases and publications targeted at seaweed farming communities in other regions of the Philippines. Relevant training modules capturing knowledge and experiences from the project will be prepared and made available online as well as in printed form for distribution.

Gender issues will be streamlined across all capacity building and awareness raising activities. The project will directly support women empowerment through creating knowledge and enhancing conscious recognition of women's work. This will involve working with women and men separately to address the following issues:

- Women's self-esteem will be enhanced so they are encouraged to talk about their work.
- Men will be made aware and sensitized of women's involvement in seaweed value chain.
- Women's awareness will be enhanced and recognized.
- Women's involvement in decision making will be strengthened.
- Study tours will engage both women and men, organized in a way to promote at least 40% of female participants.

All this requires sensitive work at the community level including moderators/ mediators that help to facilitate discussions and find solutions.

Youth empowerment will also be addressed in this component through youth-targeted development assistance and engagement youth as partners.

The activities and corresponding outputs included in this component are:

Component 3. Awareness and capacity building at local level in Tawi-Tawi	
Activities	**Expected Outputs**
1. Capacity building for LGUs and local communities focused on design, installation and maintenance of water and energy systems with focus on equitable access to water of all groups, including specific women's needs	LGUs fully capable of maintaining the infrastructure and harnessing its benefits for the local communities in a gender sensitive way. Women involvement in decision making at community level strengthened.
2. Capacity building of the LGUs in water-energy-food nexus planning in the context of climate change, including addressing gender issues (women participation in seaweed value chain, engagement of women in decision making etc.)	Training in preparing inclusive and gender-sensitive local water-energy-food planning through learning-by-doing. Relevant training modules developed. New or updated local climate change action plans prepared.
3. Climate-smart and gender inclusive capital investment planning for sustaining infrastructure services involving public and private sectors and financial, insurance and banking sectors	Process of climate-smart investment planning introduced and documented in LGUs. Climate-smart investment plans prepared for LGUs.
4. Increasing awareness on the benefits of resilient and low-carbon infrastructure for seaweeds production communities (adaptive water management, use of renewables, energy storage)	Seminars conducted targeting LGUs and seaweeds farmers' and community cooperatives on the socio-economic and cost benefits of sustainable infrastructures. Women-targeted and youth-targeted trainings conducted.
5. Building awareness of women engagement in seaweed value chain and empowering women	Specific training targeted for women engaged in seaweed value chain prepared and conducted. Specific trainings on women involvement for men engaged in seaweed value chain prepared and conducted Seaweed producing women groups on each island established or strengthened with direct capacity building support.
6. Knowledge management and dissemination	Gender-responsive Knowledge Management Plan prepared. Project lessons learnt documented (with focus on gender and youth). Site visits, study tours conducted (gender and youth responsive). Training modules, publications and media releases prepared and disseminated in other seaweeds producing municipalities in BARMM as well as in similarly situated islands in Region IX (Zamboanga Peninsula) and Region IV-B (MIMAROPA).

Component 4. Project scaling up

This component is component is focused on preparatory activities for project scale up. Due to the fact that seaweed farming is widespread in the Philippines in areas with similar problems (water and electricity access) the project is highly scalable in the Philippines context. Therefore, the project will focus on preparation of relevant documentation and plans for scaling up of the activities in Tawi-Tawi province, BARMM region and other provinces in the Philippines.

This will leverage project outcomes for the Philippines through private sector or other climate funds

The activities and corresponding outputs included in this component are:

Component 4. Project scaling up	
Activities	**Expected Outputs**
1. Consultation with relevant stakeholders (regional, national, international) including financial institutions and other donors; development of scaling up strategy; preparation of relevant documents	Documentation and plans for project scale up in the Philippines prepared

B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

It is estimated that total of 71,562 people would benefit directly from the project (with 35,423 women and 36,139 men) through resilient water infrastructure provided on the Sibutu and Sitangkai islands. More than 150,000[49] people would benefit indirectly from the project due to knowledge dissemination activities in the region. Exact breakdown of beneficiaries per components and activities will be provided at the fully developed project proposal stage.

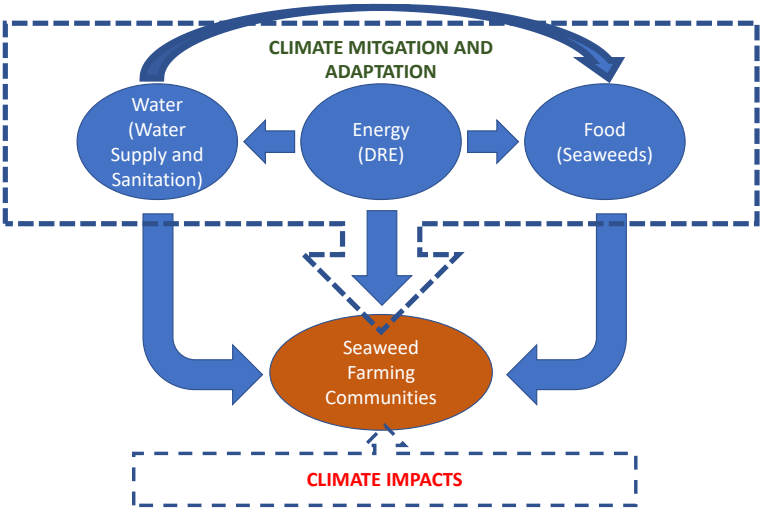


Figure 10. Water – food – energy nexus approach of the project

The Water-Energy-Food (WEF) Nexus is the main approach used in attaining the above-mentioned objectives and outcomes, focused at achieving economic, social, and environmental benefits.

To avid and/or mitigate negative impacts that could arise through the project, the project will undergo an Environmental and Social Impact assessment during the project proposal development stage, and all project activities will follow Environmental and Social Policy and Gender Policy of the Adaptation Fund. Detailed adaptation intervention (water infrastructure) will be planned based on the results of a water supply feasibility study for the project area, developed in 2022, to avoid maladaptation.

Economic benefits

Provision of reliable water services strengthened by capacity building activities will lead to increased productivity of local seaweed farmers. This in turn will result in better-quality product (RDS), delivering direct economic benefits to the communities (increased disposable income), stimulating local economy. Increasing the value-addition of seaweed production also improves its employment generation potential for local communities.

It is also expected that increased availability of water supply and water services will further stimulate other economic activities, including productive uses and small-scale manufacturing enterprise and commercial activities, offering other income opportunities hence further contributing to building economic resilience of seaweed farmers in times when harvest is poor due to environmental conditions or otherwise.

Additionally, water infrastructure will provide an additional base load in the electricity grid, making renewable energy production economically viable. Productive use of water (seaweed processing) will also constitute a base demand for the water distribution system, increasing its feasibility.

The water supply infrastructure will also create direct job opportunities in the infrastructure operation and maintenance.

Availability of reliable water supply is important for the implementation of the National Seaweeds Development Program 2017-2022 (NSDP), including the establishment of land-based nurseries, seaweed tissue culture laboratories, provision of warehouses to intended seaweed farmers cooperatives, and processing of seaweeds into higher value-added products. This is also in line with the objective of the National Seaweeds Development Program to capacitate seaweed farmers to become entrepreneurs (through cooperatives) and improve marketing of seaweeds and increase its value.

[49] This is estimated on the estimated number of families in Tawi-Tawi directly involved in seaweed farming (30,000) and average household size – 5.8 persons.

Social benefits

The availability of resilient water supply infrastructure will reduce the vulnerability of seaweed farming communities to emerging climate impacts (reduced availability of fresh water for home and agriculture use, saltwater intrusion into groundwater) as well as contribute to their health, well-being and increased quality of life.

Through provision of reliable and resilient water infrastructure, the project will create following benefit for the local communities:

- Availability of better-quality water for drinking and cooking,
- Better hygiene,
- Better opportunities for women, which are often tasked with water supply in households,
- Increased social security.

Additionally, capacity building activities will focus on gender issues in seaweed farming, bringing light to role of women in the seaweed farming communities and empowering women to fully participate in seaweed value chain.

Environmental benefits

The Project activities will provide the following direct environmental benefits, through the use of water desalination powered by renewable energy:

- Conservation of ground-water resources of the islands.
- Reduced consumption and waste of single use plastic (plastic bottles for the imported drinking water).

Through contribution of the project to increasing the production of high-quality seaweeds and stimulating seaweed farming in the region, the project will provide the following indirect environmental benefits:

- Limiting ocean acidification thanks to high daytime alkalinity of seaweeds;
- Reducing ocean deoxygenation (caused by raising ocean water temperature);
- Reduce the impacts of sea level rise through the ability to dissipate waves;
- Carbon sequestration in seaweeds biomass;
- Reduced methane emission from livestock when seaweeds are added to livestock feeds.

Additionally, the project provides climate change mitigation co-benefits:

- Mitigation of CO_2 emissions to the atmosphere (reduction of emission from diesel fuel for electricity production);
- Reduction of emissions from water transport between islands (water import);

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

Climate change impacts in the islands (seawater level rise) make investment in the groundwater-based water system not feasible in the long term. Also, rainwater harvesting is going to become less reliable method for the communities due to increasing climate change effects including sea level rise, saline water intrusion into the ground water and less predictable rains. Hence the desalination technology is identified as the most feasible solution for the selected islands to address these problems.

Among available desalination technologies, the reverse osmosis technology is currently the least energy intensive compared to other, thermal, technologies such as multi-stage flash (MSF) and multiple effect distillation (MED). MSF is the most energy-intensive of the three methods and requires approximately 30 kWh of energy to produce one cubic meter of desalinated water. In comparison, MED and SWRO need approximately 13.5 and 4 kWh of energy to produce one cubic meter of desalinated water, respectively[50]. Additionally, reverse osmosis desalination technology is characterized by lowest land footprint and flexibility and simplicity of bidding requirements (compared to other technologies). This makes the selection of reverse osmosis desalination plant, powered by renewables (PV) the most suitable and effective solution for the project sites with respect to energy-specific operating costs, land availability and project implementation.

In the final price of the produced water (Levelized Cost of Water) CAPEX is the main cost factor, with electricity being the second and material (membranes) the third (Figure 8.). For the operating costs the energy cost is the highest factor, reaching about 45% of the total OPEX.

In this context a reverse osmosis desalination plant, powered by renewable energy is the most feasible, cost-effective solution to provide quality water to the island communities.

[50] Mohammadi F., Sahraei-Ardakani M., Al-Abdullah Y., Thomas Heydt G., (2020) Cost-Benefit Analysis of Desalination: A Power Market Opportunity, Electric Power Components and Systems, 48:11, 1091-1101, DOI: 10.1080/15325008.2020.1829188

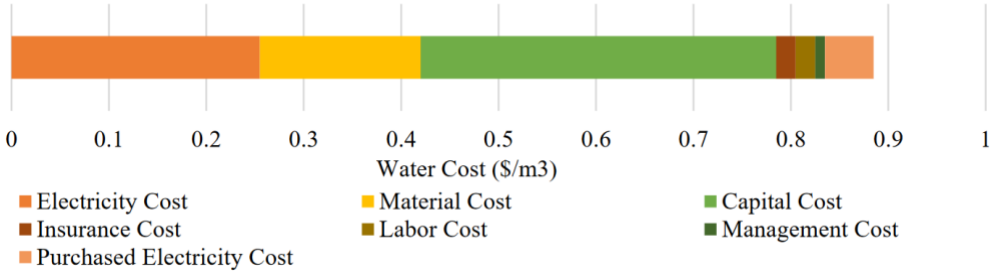


Figure 11. Average cost breakdown (Levelized Cost of Water) for large reverse osmosis desalination plants

Source: Mohammadi et al., (2020)

To increase the cost effectiveness of the intervention, the project will include rehabilitation and upgrading of existing water infrastructure instead of investing in completely new infrastructure (the number of wells for renovation will depend of the results of water feasibility study conducted within the RETS project – currently a total of 50 – 78 wells is considered).

Cost effectiveness of the project (considering the project grant) – **the cost of providing reliable water supply to the islands of Sitangkai and Sibutu is estimated at 77.7 USD per inhabitant**[51]. This includes CAPEX expenditures for infrastructure as well as capacity building and awareness raising as well as other soft activities aimed at increasing resilience.

The maintenance costs of the deployed systems (OPEX) will be budgeted by the LGUs[52], secured with income from a proposed equitable water tariff (competitive to imported, bottled water), which will be introduced to provide adequate funding for the system operation (based on relevant analysis and consultation with local stakeholders). Additionally, formation of a water utility/management unit will be analysed and proposed. It would be an entity, that could involve the local government units in partnership with the private sector to ensure the sustainable supply of water with new infrastructure.

The cost structure of the project will be refined at the project proposal development stage, based on the results of the water supply feasibility study. The cost structure of the project is designed to ensure economic sustainability of the intervention and includes sources of capital for the investment and supplementary activities aimed at supporting the beneficiaries in operation of the infrastructure.

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

Ambisyon Natin 2040

Ambisyon Natin 2040 envisions that all Filipinos experience a strongly rooted (Matatag), comfortable (Maginhawa), and secure life (Panatag na Buhay) by 2040. “With this vision, Filipinos are hoped to demonstrate close family ties and strong sense of community; Filipinos are free from poverty and hunger; Filipinos live long and enjoy a comfortable life; and Filipinos are protected by a clean and fair government.” Ambisyon Natin 2040 aims to increase the quality of life of Filipinos. The proposed project aims to contribute to poverty reduction and increased quality of life in the two island municipalities of Sitangkai and Sibutu by increasing access to electricity and water supply services, which are basic human necessities. The proposed project also aims to increase the economic resilience of seaweeds farming communities, further contributing to poverty reduction and better quality of life, by improving the productivity seaweeds farms and quality of RDS, improving their price.

PDP (Philippine Development Plan)

The Philippine Development Plan (PDP) 2017-2022 is the first medium-term plan anchored on AmBisyon Natin 2040. The PDP “is the country’s development framework that seeks to address poverty, create employment opportunities and achieve inclusive growth.” Specifically, the updated PDP, as a strategic response to the COVID-19 pandemic, seeks to have “a healthy and resilient Philippines.”

In the first place, the proposed project will contribute to reducing poverty incidence and improving quality of life of seaweed farming communities in Sitangkai and Sibutu, which are ultimate goals of the PDP, with improved quality of life as measured

[51] this value will be refined based on water feasibility study

[52] Section 17 of the Local Government Code of the Philippines directs LGUs to endeavor to be self-reliant and grants powers for essential services and facilities. Thus, LGUs assume responsibility in providing critical services such as water supply, sanitation, and flood control, including enforcement of sanitation laws.

by increasing HDI (Human Development Index). The PDP has a COVID-19 adjusted poverty incidence target of 14% by 2022, from 23.5% in 2015, and expects the HDI to continue to improve from 0.693 also in 2015.

The proposed project will contribute specifically to the following overall strategies of the PDP, which are shown in the figure below:

1) Expand opportunities across regions
2) Expand access to economic opportunities, particularly in the agriculture sector
3) Scale-up technology adoption
4) Transform human capital development towards greater agility
5) Ensure food sufficiency and reduce vulnerabilities
6) Accelerate strategic infrastructure development, in this case particularly energy and water supply infrastructures
7) Build safe, resilient, and sustainable communities
8) Ensure ecological integrity, clean and healthy environment

The PDP 2017-2022 recognizes the widespread impacts of climate change. In this regard, the National Spatial Strategy of the PDP (NSS) "aims to contribute to inclusive growth by improving physical connectivity and providing equal access to quality social services across regions…(It) seeks to make vulnerability reduction an integral part of development. This involves instituting prevention and mitigation measures to reduce the impact of climate change and disasters. These measures include redundancy routes to provide access to areas affected by disasters. Due to its geographical location, the country is susceptible to geologic and hydrometeorological hazards. Disaster risk is also aggravated by uncontrolled development particularly within ecologically sensitive and hazard-prone areas.

The proposed project, by increasing access to resilient water and electricity supply infrastructures, increasing the economic resilience of seaweed farming communities, and increasing climate awareness and adaptive capacity of local governments and communities, leading to integrative climate planning, will reduce the vulnerability of seaweeds farming communities to climate change impacts and disasters.

The awareness and capacity building components of the project are in line with the goal of the PDP in "Developing smart and resilient public organizations and future ready public servants".

The PDP also calls for the enforcement of food safety standards and regulations as part of its strategy in ensuring food security. The project will make sure that the water produced by the planned desalination plants and retrofitted communal water supply systems would be in accordance with the Philippine National Standard for Drinking Water. The project will also build the capacity of seaweeds farmers so their farming practices and the technologies they use conform with the Philippine National Standard on the Code for Good Aquaculture Practices for Seaweed.

NDC (Nationally Determined Contributions)

Through the NDC[53], the Philippines commits to a projected GHG emissions reduction and avoidance of 75%, of which 2.71% is unconditional and 72.29% is conditional, representing the country's ambition for GHG mitigation for the period 2020 to 2030 for the sectors of agriculture, wastes, industry, transport, and energy.

The proposed project, by utilizing clean and efficient energy technologies based on renewable energy resources to power the water supply systems, contributes even if in a small way to this NDC target.

The NDC also recognizes the importance of capacity building in increasing the adaptive capacity of the country. Indeed, the proposed project through its capacity building and awareness components aims to contribute to addressing the very poor adaptive capacity of the Province of Tawi-Tawi.

The NDC also recognizes the importance bilateral, regional and multilateral cooperation in implementing the mitigation commitments. The project will be a continuing cooperation between MINDA and the UNIDO, among other partners, in the Province of Tawi-Tawi, in fact, building on an ongoing cooperation to address the poor electricity access in the two island municipalities through renewable energy.

The NDC upholds the NCCAP, the PDP, and the PEP among other national sustainable development plan and frameworks in achieving the country's commitment to this global goal.

National Framework Strategy on Climate Change (NFSCC)/NCCAP (National Climate Change Action Plan)/NAP (National Adaptation Plan)

The National Framework Strategy on Climate Change (NFSCC) was established by the Climate Change Act (RA 9729) in 2009, to guide the country in developing programs and policies in response to climate change. The main goal of the framework strategy is to build the adaptive capacity of communities and increase the resilience of natural ecosystems to

[53] REPUBLIC OF THE PHILIPPINES Nationally Determined Contribution Communicated to the UNFCCC on 15 April 2021 https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Philippines%20First/Philippines%20-%20NDC.pdf

climate change and optimize mitigation opportunities towards sustainable development. The NFSCC envisions a climate risk-resilient Philippines with healthy, safe, prosperous, and self-reliant communities, and thriving and productive ecosystems Further, it also highlights the mutually beneficial relationship between climate change mitigation and adaptation. The NFSCC serves as the framework for the development of local and national climate change action plans.

The NFSCC serves as the roadmap for increasing the country's social and economic adaptive capacity, the resilience of its ecosystems, and the best use of mitigation and finance opportunities. The NFSCC defines the overall parameters for developing a national action plan. It identified adaptation as the anchor strategy and considered mitigation as a function of adaptation.

The NCCAP details the long-term agenda of the country at all levels of government for climate change adaptation and mitigation covering the period of 2011 to 2028, which is divided into three 6-year phases that coincide with the terms of the Philippine Development Plan (PDP) and the national electoral and planning cycles. The NCCAP's ultimate goal is to "build the adaptive capacities of women and men in their communities, increase the resilience of vulnerable sectors and natural ecosystems to climate change and optimize mitigation opportunities towards gender-responsive and rights-based sustainable development." It identifies communities and areas most vulnerable to adverse impacts (of climate change) and considers differential impacts on women, children and marginalized populations.

The project will directly contribute to most of the key strategic priorities and expected outcomes of the NCCAP, namely, food security, water sufficiency, ecological and environmental stability, sustainable energy, and knowledge and capacity development.

A key strategic priority of the NCCAP that impacts the achievement and cuts across its other key priorities is knowledge and capacity development. Its goal is to enhance capacity for climate change adaptation, mitigation, and disaster risk reduction at the local and community level. One of the overall objectives of the proposed project "Increase climate awareness and adaptive capacity of LGUs in Tawi-Tawi and seaweeds production communities" contributes directly to achieving this climate strategy. As its adaptation measures for the energy sector, the NCCAP aims for the climate-proofing, rehabilitation and improvement of energy and transport systems and infrastructures. Thus, one long-term goal under the NCCAP is to mainstream adaptation in energy development projects by climate proofing of energy infrastructures and systems to withstand extreme weather phenomena and conditions induced or caused by climate change.

NDRRMP (National Disaster Risk Reduction and Management Plan)

The proposed project contributes to the overarching goal of the NDRRMP of a "safe, adaptive, and disaster-resilient Filipino communities towards sustainable development" by building resilient electricity and water supply infrastructures, increasing knowledge and skills, and reducing vulnerabilities of seaweeds farming communities by increasing their economic resilience. The project directly upholds one of the key results areas of the NDRRMP, which is Disaster Risk Reduction. The infrastructure investments in the project represents a key strategic action under the NDRRMP, which is Investing for Resilience, as well as contribute directly to one expected outcome, which is Increased structural integrity of critical infrastructure (besides housing and building). On the other hand, the capacity building component of the project, including activities to increase awareness of all stakeholders and target beneficiaries and capacity of local governments, represent two other strategic actions under the Plan, which are Understanding Risk and Strengthening Risk Governance, as well as contribute to these expected outcomes of the Plan: Enhanced risk awareness and risk-informed decisions and actions of governments and communities; and Increased institutional capacities of local DRRM offices.

The NDRRMP includes recommendations on comprehensive actions that should be taken at the local levels to increase resilience and adaptive capacity of communities. These actions should be considered in the final design of the activities in the proposed project.

Philippine Action Plan for Sustainable Consumption and Production (PAP4SCP)

The PAP4SCP aims that natural resources are efficiently used and equitably allocated, and in this regard, innovation and investment in green technologies and systems increased. The proposed project will build water supply systems that will be powered largely by solar PV. The proposed repair and rehabilitation of existing water supply infrastructures and construction of desalination plants, also powered by the solar PV mini-grid, will contribute to the equitable allocation of water resources in the two island municipalities.

PWSSR (Philippine Water Supply Sector Roadmap)

The proposed project is aligned to the vision and strategies of the Philippine Water Supply Sector Roadmap (PWSSR)[54]. The PWSSR had envisioned that:

[54] https://pidswebs.pids.gov.ph/CDN/PUBLICATIONS/pidsdps2033.pdf

3) By 2010, 432 waterless municipalities shall have graduated to more than 50% access coverage and sustaining utility operations; that existing formal/legal utilities are expanding coverage to unserved areas, and that 60% of water service providers shall have been regulated from the current 40% level.
4) By 2015, the water supply sector shall have achieved the MDG target of halving the proportion of the population without sustainable access to safe drinking water and basic sanitation.
5) By 2025, universal access coverage and sustained utility operations have been attained; that existing formal/legal utilities continue to expand coverage at par with population growth, and; that all water service providers shall have been regulated.

Along with the 2025 target, the Roadmap calls for the: “Timely provision of adequate water supply facilities from source development to distribution,” that is, “Water supply demand by the population is met through adequate and sustainable infrastructure.” In this regard, the Roadmap targets that Level II and Level III water systems are provided supposedly in the medium term (2015) in areas/communities with less than 50% service.

“The LGUs are responsible for the delivery of basic services including water supply and sanitation under the Local Government Code of 1991 while other agencies are providing support to LGUs and the WSPs in implementing their mandates and responsibilities.” So the Roadmap includes a strategy in building the capacity of LGUs, among other stakeholders, to support the delivery of water supply services with the provision of additional water supply facilities through infrastructure development

Philippine Water Supply and Sanitation Master Plan, 2019-2030 (PWSSMP) identified eight reform areas, namely: (1) establishing effective WSS sector institutions; (2) strengthening regulatory environment; (3) balancing water supply and demand; (4) building climate resiliency; (5) creating and ensuring effective WSS services; (6) enabling access to funding and financing; (7) managing data and information; and, (8) driving research and development.

PEP (Philippine Energy Plan)

For the long-term (2017-2040), the DOE will be guided by the eight Energy Sector Strategic Directions. It focuses on securing reliable energy supply, expanding electricity access to all consumers, protecting consumer welfare, and ensuring high level of consumer satisfaction. In addition, Strategic Direction 3 “Promote Low Carbon Future” refers to energy efficiency and renewable energy. The proposed project contributes directly to the renewable energy, energy efficiency and conservation, and energy resiliency policy and programs of the government through the PEP.

National Renewable Energy Program (NREP) 2020-2040

The NREP 2020-2040 aims to contribute to consumer empowerment by increasing the adoption and application of renewable energy in rural areas not only to increase access to electricity but also to exploit its applications in delivering basic social and economic services particularly in the agriculture, fisheries, health, and education sectors. The proposed desalination plants and retrofitted or rehabilitated communal water systems will be powered by the hybrid RE mini-grids to the extent that these could be connected to the mini-grid. Otherwise, these water supply systems will be powered by decentralized or stand-alone solar PV systems.

Energy Efficiency and Conservation Program

The project will also rehabilitate the communal water supply systems so that they conform to energy efficiency standards (for example, using high efficiency motors for its water pumps and the premises are well lighted using more efficient lighting systems). Needless to say, the desalination plants will be installed using energy-efficient electrical and mechanical systems that conform to the national electrical safety code (Philippine Electrical Code).

Energy Resiliency Policy and Program

In response to Philippine Disaster Risk Reduction and Management Act of 2010 (RA 10121), the DOE issued DC 2018-01-0001 Adoption of Energy Resiliency in the Planning and Programming of the Energy Sector to Mitigate Potential Impacts of Disasters on 17 January 2018 to guide its Energy Resiliency Policy (ERP). The ERP’s guiding principles are a) strengthen existing energy infrastructure; b) implement the build back better principle in terms of reconstruction and rehabilitations of damaged infrastructure; c) improve existing operational, maintenance and practices to ensure continuous operations and energy supply; and d) develop resiliency standards that will be used as basis in future construction of energy facilities.

On top of upgrading the capacity of the hybrid RE mini-grids in the two islands, which are nearing completion at this writing, the proposed project seeks to further “harden” the existing power supply infrastructures to make it more resilient to climate risks and ensure supply of clean energy to the water supply systems even in times of extreme weathers.

E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the

Environmental and Social Policy of the Adaptation Fund.

The project activities will adhere to all relevant national technical standards in the field of infrastructure and services, applicable to:

- civil works and construction materials,
- drinking water quality,
- photovoltaics and electric equipment,
- good aquaculture and raw dried seaweeds.

Compliance with national standards will be required from all contractors through provision of relevant clauses in contract agreements.

The National Building Code (P.D. 1096) apply to the design, location, siting, construction, alteration, repair, conversion, use, occupancy, maintenance, moving, demolition of, and addition to public and private buildings and structures, except traditional indigenous family dwellings. Therefore, all structures built within the project will need to comply with the Code.

All construction materials and equipment will comply with existing relevant standards[55].

Philippine National Standard for Drinking Water of 2017: includes technical standards for the quality of drinking water, water sampling and examination, and other mode of distribution of drinking water. These standards apply and shall be complied with by bulk water suppliers, among other drinking water service providers.

Philippine National Standard on the Code for Good Aquaculture Practices for Seaweed 2017[56] covers practices that aim to prevent or minimize the risk associated with the production and harvesting of seaweed in brackish and marine waters either in land-based or sea-based facilities including the gathering of those washed-ashore and wild stock. This Code covers the aspects of production and harvesting, and addressing food safety and quality, plant health, environmental integrity and socio-economic welfare. This Code applies to production areas where seaweeds are farmed and harvested[57].

Philippine National Standard (PNS) for Dried Raw Seaweed 2010[58] prescribes quality specifications and safety requirements of dried raw seaweed of the class Rhodophyceae (red seaweed) such as but not limited to *Kappaphycus spp.* And *Eucheuma spp*.

The project will comply with the Environmental and Social Policy (ESP) of the Adaptation Fund - Environmental and Social Impact assessment will be done during the project proposal development stage. Implementation of the project will strictly follow the ESP guidelines.

F. Describe if there is duplication of project / programme with other funding sources, if any.

There is no duplication of the project with other funding sources. The following activities in the project area have been identified, with a scope relevant to the proposed project.

1. The Mindanao Water Supply Program of MinDA (MinDA Water)

The program aims to:

1) Increase access to water supply for drinking and for irrigation;
2) Increase access to sanitation and hygiene facilities to reduce water-related diseases;
3) Improve productivity of farmers in the geographically isolated and disadvantaged areas,
4) Enhance capacities of LGUs or its LGU-run Water Utilities, Potable Water Service Providers and Irrigation Service Providers in the operations and management to ensure sustainability.

The program has 3 components: Infrastructure Development, Technical Assistance and Capacity building, and Governance Reform and Institutional Development. MinDA partners with DILG and DBP for the implementation of the program, with DBP naturally providing the financing for the infrastructure component.

The program includes Sitangkai and Sibutu, but the islands have not been included in the scope of the activities of the program as of 2021.

[55] E.g. the Government Procurement Policy Board (GPPB) provides relevant guidance on applicable standards: https://www.gppb.gov.ph/laws/laws/CPESGuidelines2011/Annex12.pdf

[56] Philippine National Standard on the Code for Good Aquaculture Practices for Seaweed.

[57] This code is now being updated. This is from the draft 2021 version of the code. http://www.bafs.da.gov.ph/assets/images/Draft_PNS/Working%20Draft_PNS%20GAqP%20Seaweeds.pdf.

[58] http://spsissuances.da.gov.ph/attachments/article/779/PNS%20BAFPS%2085_2010%20Dried%20raw%20seaweed.pdf

2. RETS project

The Renewable Energy Technology to Increase Value-Added of Seaweeds in Tawi-Tawi (RETS) project is deploying hybrid solar PV mini-grids in Sitangkai and Sibutu. Together with another EU-funded programme implemented by MINDA and NEA, called I-PURE Project (described below), RETS aims to provide universal electricity access to Sitangkai and Sibutu. The project will also develop decentralized renewable energy (DRE) systems in the municipalities of Panglima Sugala, Tandubas, and Sapa-Sapa to provide electricity supply to seaweed value chain facilities or processes. Besides increasing access to clean electricity to seaweed farming communities and the seaweeds value chain in these municipalities, the project also aims to:

- Integrate the assessment and design of a feasible water supply system
- Increase the production of raw dries seaweeds and the value added of seaweed farming and increase its income and employment generation potential through the availability of electricity services and use of renewable energy technologies (RETs)
- Improve the delivery of community services such as health and nutrition, education, sanitation through the availability of electricity services in off-grid and rural seaweed farming communities.

The RETS project is also conducting feasibility study of a sustainable water supply systems in Sitangkai and Sibutu in cooperation with MinDA. This study will be delivered in June 2022 and will be utilised for a detailed design of adaptation project intervention. See Annex II for details. The results of the study will be presented in the fully developed project proposal.

The project has also conducted a value chain analysis (VCA) of seaweeds in Tawi-Tawi, including other applications of renewable energy technologies. In this regard, the project is also deploying floating solar dryer in Sitangkai and Sibutu in cooperation with DOST through MSU-TCTO, one of the RETS project partners.

The RETS project activities will be finalised before the start of the proposed adaptation project and will constitute a baseline for the proposed project.

3. The I-PURE Project[59]

The Integration of Productive Uses of Renewable Energy for Inclusive and Sustainable Energization in Mindanao or I-PURE Mindanao Project is a cooperation between the National Electrification Administration (NEA) and the Mindanao Development Authority (MinDA) with a Euro 4.5 million funding from the European Union - Supported Access to Sustainable Energy Programme (EU-ASEP).

The overall objective of the I-PURE Project is to bring about inclusive and sustainable social and economic development to the sites through improved livelihood activities and sustainable access to energy through renewable energy solutions. Aligned to this objective, the central precept to the selection of the activities and sites for the project is the shift from the traditional practices of deploying renewable energy technologies for stand-alone household energy applications (lighting, radio, others) to a solution that combines renewable energy solutions for livelihood activities and household energization.

The I-PURE Mindanao Project is being implemented in the franchise areas of South Cotabato II Electric Cooperative, Inc., Sultan Kudarat Electric Cooperative, Inc., Tawi-Tawi Electric Cooperative, Inc. (TAWELCO), and Cotelco, Inc.. and in the municipalities of Sitangkai Tawi-Tawi, Sibutu Tawi-Tawi, Arakan N.Cotabato, Kidapawan N.Cotabato, Tulunan N.Cotabato, Bagumbayan Sultan Kudarat, Kalamansig Sultan Kudarat, Ninoy Aquino Sultan Kudarat, Lebak Sultan Kudarat, Glan Sarangani, and Picong Lanao del Sur.

4. SeaRDeC

The Department of Science and Technology is funding the research program "Establishment of the Seaweed Research and Establishment of Seaweed Research and Development Center (SeaRDeC) to support the Seaweed Industry in the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM):" The program has 3 component projects:

- Project 1: Optimization of laboratory and land-based nursery culture technologies of Kappaphycus spp. and Euchuema denticulatum – Prof. Karen B. Serag, Project Leader
- Project 2: Molecular characterization, selection, and production of high quality eucheumatoid cultivars in the Bangsamoro Autonomous Region in Muslim Mindanao
  Dr. Sitti Zayda B. Halun, Program/Project Leader
- Project 3: Optimization of post-harvest handling of Kappaphycus spp. and Eucheuma denticulatum – Dr. Sitti Zayda B. Halun, Program/project Leader

The general objectives of the program are to optimize the seaweed (Kappaphycus and Eucheuma) value chain in Tawi-Tawi and create and promote a commercially sustainable cultivated seaweed industry in the BARMM. Its ultimate objectives are:

[59] https://www.facebook.com/IPureMindanao/

- Better quality of life of seaweed farmers
- Sustainable seaweed industry
- Raw dried seaweeds that meet the Philippine national quality standards

Its targets are:

- 15 % increase in seaweed production in Tawi-Tawi
- 20 % increase in annual income of farmers by 2023

The specific objectives to meet these targets are:

To optimize seedling culture technologies for *Kappaphycus spp*. and *Eucheuma denticulatum*. The project will develop strains that would have higher growth rates and climate change resilient varieties. To genetically assess, screen, and optimize production of high quality seedstocks *of Kappaphycus spp*. and *Eucheuma denticulatum* for a sustainable seaweed industry across the Sulu Archipelago (BARMM). For this purpose, the project will establish seaweed nurseries in Lato-Lato in Bongao, Panglima Sugala, Sitangkai and Sibutu. These nurseries would require power and water. To optimize postharvest handling practices and improve the quality of raw dried *Kappaphycus spp.* and *Eucheuma denticulatum* in the BARMM. The program started in Feb 2020 and will end in Feb 2023. It will be training 50 farmers on best seaweed health and farm management practices--in at least 6 municipalities-Sitangkai, Sibutu, panglima Sugala, South Ubian, Tandubas and Sapa-Sapa. It will also distribute 5 tons of high quality Kappaphycus cultivars (fast growing, resistant to ice-ice disease and high carrageenan yield and quality).

Summary of synergies and duplications is presented below.

Project/programme	Synergies	Duplications
Mindanao Water Supply Program of MinDA (MinDA Water)	Demonstration of viability of small-scale desalination in water supply of the islands and productive use of water supply to increase economic and social security of the islands.	Currently the program does not include any activities in the project area due to shortages in government funding. This will be further explored in the project design stage through consultative process to avoid duplication of funding.
Renewable Energy Technology to Increase Value-Added of Seaweeds in Tawi-Tawi (RETS)	Use of deployed energy infrastructure for powering water supply. Water feasibility study provides a baseline for the proposed AF project. Proposed project will build on experiences of successful implementation of the RETS project.	Duplications have been avoided at the concept design stage.
Integration of Productive Uses of Renewable Energy for Inclusive and Sustainable Energization in Mindanao or (I-PURE)	The proposed AF project will use experiences of the I-PURE project in the productive use of electricity in seaweed farming communities. This could be integrated in capacity building activities.	I-PURE project focuses on electricity supply and use. There is no duplication.
Establishment of the Seaweed Research and Establishment of Seaweed Research and Development Center (SeaRDeC)	The proposed AF project concept will utilise knowledge products developed by seaweed research and development center in MSU-TCTO. Also cooperation with seaweed nurseries developed by the SeaRDeC project will be established. Water provision to the seaweed nurseries would be done by the developed AF funded infrastructure.	No duplications identified as SeaRDeC project is targeting seaweed production techniques, knowledge and trainings.

G. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

This project seeks to test the effectiveness of the proposed technology in the specific island setting and addressing the outlined challenges due to climate change. Project results are also vitally important for further roll-out to other sites in the region and the country. It is therefore critical that the process is fully documented, to provide guidelines and instructions for further implementation and scaling up in the Philippines.

Knowledge management is inherent to UNIDO's operating modality by sharing experiences across its interventions worldwide. This has been demonstrated through many high-quality publications, organization of events, webinars, and more. The establishment of and/or support to regional expert centres is one of the key elements to secure technology transfer, strengthen regional and global exchange and for locally building human capital and institutions. Examples are UNIDO's support for National Cleaner Production Centres, Small Hydropower Development (China), various Centres for Renewable Energy and Energy Efficiency, co- hosting the Climate Technology Centre and Network (CTCN), and others.

In the proposed project, a set of knowledge management activities is envisaged with the objective to define a solid exit strategy, facilitate the flow of information and knowledge to national and international stakeholders and beneficiaries, as well as to recollect experiences from the Philippines during and after the project. These will be key for scaling up activities for the project.

Moreover, a 'Knowledge Management Strategy' in line with the requirements of Knowledge Management of the Adaptation Fund will be designed and implemented under the proposed project, which will function as the basis for gathering and distributing all data, information and lessons learnt generated during the implementation of the project. The strategy will be based on the principles of synergy, transparency, participation and inclusion, flexibility, relevance and cost-effectiveness, as outlined in the Project-level Results Framework and Baseline Guidance of the Adaptation Fund[60].

As a first step, the strategy will foresee a local, regional and international stocktaking of available and relevant information, paying particular attention to the networks of the stakeholders involved. The strategy will also include the development of a knowledge management system and a website and associated platform with information accessible by the public including direct project stakeholders.

The planned dissemination activities include study tours, site visits, media releases and publications planned. Additionally training modules will be developed and made available to all interested parties in the country.

H. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

This project concept is based on the result of consultations with stakeholders done during the implementation of the RETS project and following consultations with selected stakeholders specifically for the development of this concept.

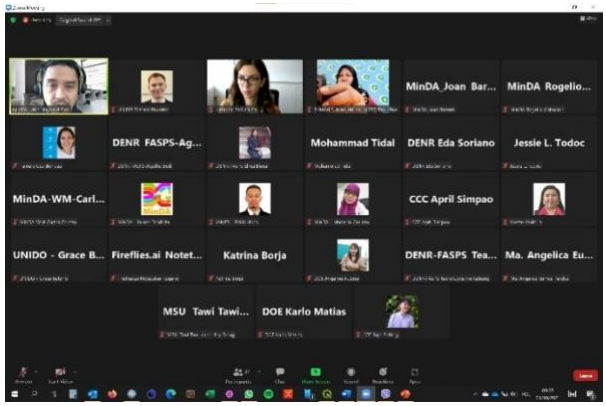
Local communities have been engaged directly in the field water survey conducted by the RETS project in 2019/2020, which covered 11 BLGUs (Barangay Local Government Unit - basic settlement units – villages). Leaders of those communities were surveyed in the field in the context of their current water supply status, their needs, and expectations. These results were used in the design of the concept – as the main need for sustainable water supply in the islands has been identified as a main concern of the communities. The RETS project did not address those issues.

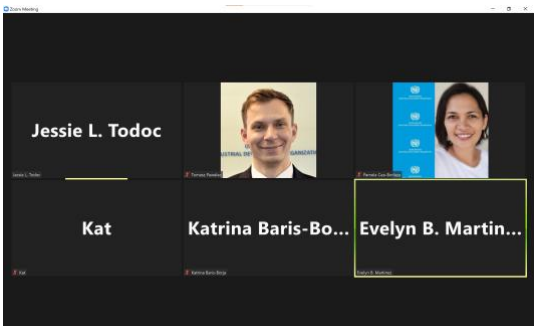
During the following project concept preparation stage local government units – leaders of the communities have been consulted, these include 2 LGUs: Sibutu and Sitangkai. Also, the following consultations were conducted (due to restrictions in travel all meetings were either in online format or through phone when internet connection was not satisfactory).

Table 1. List of stakeholder consultations for the preparation of the project concept.

Date	Scope and outcome of consultation	Stakeholders consulted
2019/2020	Field survey of water supply in Sitangkai and Sibutu (within the RETS project). 7 barangays inspected in Sibutu and 4 in Sitangkai (covering ca. 50% of the local population). Outcome: it has been found that most systems have no treatment facility, there are limited numbers of communal faucets, supply of water is intermittent, and some wells are not working due to inadequate funds for operation and maintenance. Improvement of water system has been indicated as main issue.	Local communities and community representatives at Barangays: Tongmageng, Tonggusong, North Larap, South Larap, Mokhtar Sulayman, Tongsibalo, Ligayan, Sheik Makdum, Taungoh, Tongehat, Ungus-Ungus

[60] https://www.adaptation-fund.org/wp-content/uploads/2015/01/Results%20Framework%20and%20Baseline%20Guidance%20final%20compressed.pdf

8 June 2021	Presentation of the project idea note based on the needs identified during the implementation ofthe RETS project, discussion on the possible cooperation. Outcome: Based on the analysis of the current water supply infrastructure and its impact on resilience and livelihoods a decision was formed to prepare project concept for AF funding.	Mindanao Development Authority
17 June 2021	Follow-up consultation on the project concept – detailed discussion on the project rationale and scope. Outcome: further refinement of the project concept scope based on MinDA's development projects experience in Tawi-Tawi	Mindanao Development Authority
17 June 2021	Discussion of the project relevance to the selected project area based on MSU experience in the proposed project area Outcome: gender issues in seaweed farming raised and discussed; discussion on MSU project (SeaRDeC) and possible synergies/duplications; further refinement of the project concept scope	Mindanao State University Tawi-Tawi College of Technology and Oceanography
30 July 2021	Discussion of the project idea – initial endorsement for the project idea. Guidance for further project development from the CCC. Outcome: suggestions to the project concept scope and initial endorsement (confirmed adaptation needs in the area)	Climate Change Commission of the Philippines
25 August 2021	1st Technical Working Group (TWG) meeting: - Setting up the TWG, - Presentation of the project idea and Adaptation Fund requirements, - Discussion on the project concept (see Annex I for detailed notes) Outcome: identification of critical issues in the area in water supply, climate impacts and main social and economic sustainability issues; suggestions to the project concept scope and initial endorsement by TWG (please refer to detailed minutes in the annex) 	Mindanao Development Authority, Department of Energy (DOE), Department of Environment and Natural Resources (DENR), Climate Change Commission (CCC), Department of Science and Technology (DOST), PLGU of Tawi-Tawi, Mindanao State University Tawi-Tawi, Ministry of Agriculture, Fisheries and Agrarian Reform – BARMM, Ministry of Environment, Natural Resources and Energy – BARMM, UNIDO (see Annex I for detailed list of participants)
3 September 2021	Discussion on water supply situation in Sibutu Outcome: confirmation of the existing needs in water supply and climate impacts in the area, expressed support to the proposed project concept	Sibutu Local Government Unit

1 October 2021	2nd TWG meeting: - presentation of the project concept for the Adaptation Fund - discussion on the project concept (see Annex I for detailed notes)  Outcome: further suggestions to the project concept scope and endorsement by TWG (please refer to detailed minutes in the annex)	CCC, DENR, DOE, DOST, MSU-TCTO, BARMM – MAFAR, BARMM – MOST, BARMM – MENRE, PLGU of Tawi-Tawi, MinDA, UNIDO (see Annex I for detailed list of participants)
1 – 14 October 2021	Draft Project Concept document shared for review and comments with TWG members. Outcome: small modifications of the project concept document	CCC, DENR, DOE, DOST, MSU-TCTO, BARMM – MAFAR, BARMM – MOST, BARMM – MENRE, PLGU of Tawi-Tawi, MinDA
7 October 2021 18 October 2021	Situation and conditions of seaweeds farmers in Sitangkai and Sibutu Outcome: confirmation of the importance of water for the area and seaweed processing, confirmed importance of fresh water supply in seaweed value chain; expressed support to the proposed project concept  	Tawi-Tawi Provincial office of BARMM - MAFAR

During the consultations gender issues have been considered as well as environmental and social issues, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

Additionally, during the work on project concept key inputs to the design of the project were provided by:

- MINDA staff, which similarly provided key inputs and comments, particularly as regards the MINDA Water Supply Program, which is presented in this report. MINDA also provided other general reference documents on BARMM and Mindanao.
- Dr. Zayda Halun of the MSU-TCTO, a member of the TWG, who provided key inputs and comments to the project concept. MSU-TCTO's research outputs and publications on climate adaptation and seaweed farming in Tawi-Tawi have been key resources to this draft project concept.

Minutes from official Technical Working Group meetings and other supplementary material has been presented in the Annex I.

In order to build on this initial consultative process utilized during the concept design and preparation, during the fully

developed project developed phase a number of follow-up consultative activities will be undertaken to ensure that the target communities at the selected sites are adequately consulted and their views taken into account in project design. Furthermore, comprehensive community level consultations at the targeted sites will be undertaken at the inception phase of the project prior to roll-out of the project activities.

I. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Currently, the demand for water in Sitangkai and Sibutu is underserved by communal water delivery system. Existing service provision is inefficient, too costly for the communities and is becoming unreliable due to climate change. Therefore, reliable technologies coupled with public subsidies are necessary to provide reliable, resilient water access.

In the absence of the project the communities in Sitangkai and Sibutu would be served by unreliable water system based on ground water (Sibutu) and water harvesting (Sitangkai), which would become more and more affected by the climate change leading to lower availability of freshwater. In turn the communities would need to import bottled water from other islands in the province, leading to continuously increasing cost of water for the society. This would limit the use of water for productive purpose (seaweeds processing) and decrease value of the final product. All these factors would eventually lead to worsening living conditions (health, hygiene) and impacting economic status of the seaweed farming communities.

Desalination is among the most expensive methods of water delivery (because of high CAPEX and electricity cost share in the final price of produced water), therefore small LGUs in Tawi-Tawi cannot provide enough funding for the project. On the other hand, the market is too small to attract private investment without subsidies. Low economic potential of the islands in Tawi-Tawi, and relatively low consumption water, the price of commercially produced water would not be feasible for the communities, resulting in even lower water consumption.

Therefore, the most viable solution is a grant funding covering the full cost of water system deployment and upgrading in the islands, which is the full cost of adaptation to climate change.

The outcomes of the RETS project (baseline project) will be achieved by June 2022 prior to the start of the proposed AF project. Hence there is no anticipated risk for realizing the proposed activities under the project submitted for AF funding. The AF project will rather build upon the strong results and lessons learnt during the implementation of the RETS project.

J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project / programme.

The project will develop infrastructure to provide the necessary adaptive access to water and its associated direct benefits. The non-infrastructural components of the project are also specifically geared to provide increased knowledge and skills to increase resiliency at all levels of the project interaction. The project has been designed with sustainability of the outcomes in mind. The proposed investment component will be accompanied by components with soft activities focused on building ownership and management of the infrastructure, assuring proper maintenance and use of the deployed systems.

The project is designed in sustainability in a wider scale - planned activities in the scaling up component will additionally increase the sustainability of the intervention through replication and scaling up with other funds (i.e. Green Climate Fund) and/or private sector.

Relevant analysis to identify main long-term project sustainability factors based on other relevant project experiences, dedicated field study and broad stakeholder consultations (engagement of seaweed communities incl. women and youth) will be done during the development of the full project proposal. Based on this project design will be adjusted to ensure long term economic and social sustainability.

Institutional sustainability

The project is fully compliant with Philippine policy framework and follows guidelines of the Philippine Development Plan and National Disaster Risk Reduction and Management Plan. It directly implements Philippine Water Supply Sector Roadmap in the area and principles of Philippine Action Plan for Sustainable Consumption and Production.

The project builds on institutional framework which is already in place (local government units are responsible for water supply of the communities) and specific activities which will be implemented focus on strengthening of this structure and building capacity of LGUs in climate resilient water supply (Component 3).

Knowledge management will also strengthen the sustainability of the project outcomes, allowing for easy scaling up of the interventions. Relevant stakeholders at the regional (BARMM, MinDA) and national level (government) will be involved in the project to ensure sustainability and replicability of its outcomes.

Through the provision of execution support to MinDA, the institutional capacity of MinDA for project execution will be built and strengthened, which will contribute to institutional sustainability of the project.

Economic and social sustainability

To ensure economic and social sustainability of the deployed water infrastructure, the project will include:

a) formation of a water utility/management unit. It would be an entity, that could involve the local government units in partnership with the private sector. In the water feasibility study, the possibility of public-private partnership will be explored to come up with the contractual arrangement that is the most sustainable for the case of the two islands (ensuring the ownership of the grant-funded infrastructure is kept in public domain). This entity will contribute to the sustainability of the water supply systems, as it will oversee water quality management, proper operation, and maintenance of the infrastructure, as well as the financial management of the water supply system. Formation of this unit will include consultation with barangays. This will contribute to acceptance and participation of local communities and hence support sustainability.
b) equitable tariff for water services will be established. Currently the price of imported potable water reaches 5 USD/m^3, while average market cost of water from small desalination plants is at about 1.25 USD/m^3. Although the initial investment is from a grant, the tariff will be designed to be able to cover for the proper management, and operation and maintenance of the water infrastructure system. Willingness to pay of the communities can already be established, as they currently have a high cost of clean water.

Equally important for the economic and social sustainability of the project is to ensure that the communities will be able to pay for the provided water services. This will be addressed by the project through Component 2 which focuses on seaweed industry development in Sibutu and Sitangkai, as this is identified as a main income source of the communities. Through the integration of improvements (technology, organisation, knowledge) in the seaweed value chain the project will stimulate and upgrade seaweed industry in the area, generating more income and stimulating job creation. Ultimately, this will help to ensure that communities have enough disposable income to support their ability to pay for water services.

Capacity building provided to the communities and LGUs and will enable them to fully benefit from the provided infrastructure and use it in a productive way to increase economic prosperity of the communities.

Improved water security of the communities and reduced cost of water supply compared to existing or conventional yet more expensive technology which could be implemented, are strong economic and social motivations for economic and social sustainability deployed technology. In addition, promotion of the system to the public through various media, such as articles in the media and magazines, will help to bring popular support for wider application in the region.

Environmental sustainability

The proposed project brings development with a significantly reduced carbon footprint, using renewable energy for powering the water system (desalination plants), meeting climate (SDG 13) and development goals (SDG 6). Also, other environmental factors of desalination technology will be analysed and relevant mitigation measures proposed through the Environmental Impact Assessment, to ensure that environmental damage is prevented.

K. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project / programme.

The project has undergone environmental and social risk (E&S) assessments in line with Adaptation Fund's Environmental and Social (E&S) Policy and Gender Policy and UNIDO Environmental and Social Safeguards Policy and Procedures. As a result, the project has been classified as a category B project. The proposed project is likely to have small impacts on human populations or environmentally important areas. Likely impacts will be few in number, site-specific, and few if any will be irreversible. As per the AF policy an Environmental Social Impact Assessment (ESIA) will be developed which will inform the Environmental and Social Management Plan (ESMP) prepared for the project. The initial screening of risks against AF 15 principles is presented in the table below.

E&S principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance

Compliance with the Law	The project is fully compliant with relevant national Philippine regulations. All contractors will be required to comply with existing national standards and building codes as described in section E. of the concept, as well as UNIDO Environmental and Social Safeguards. Relevant clauses will be included in contract agreements. All activities will follow guidance from the EISA and the ESMP.	**NONE**
Access and Equity		**LOW** The deployed infrastructure will be owned and operated by the Local Government Units, ensuring that all members of the communities will be able to access the deployed infrastructure. This approach will be confirmed through the stakeholder engagement process during the project preparatory stage. Water feasibility study will be available in June 2022 to refine the project design before it reached the fully developed project proposal stage.
Marginalized and Vulnerable Groups		**LOW** The project activities may have potential impact (positive and/or negative) on marginalized and vulnerable groups. As such, further assessments and related consultations will be carried out during the project preparatory stage before the project reaches the fully developed project proposal stage. An ESIA and ESMP will be developed for this project. The ESIA will assess any potential impacts on marginalized groups and vulnerable groups and will inform ESMP development. Additionally, a project-level grievance mechanism will be established and will remain accessible to all project stakeholders and effected vulnerable groups.
Human Rights	.	**LOW** The project through provision of water access may have positive impacts in enhancing the basic rights of some of the marginalized groups (minorities) in the project area. The specific potential risks and related mitigation measures will be assessed in the ESIA which will inform the environmental and social management plan (ESMP) for this project.
Gender Equality and Women' s Empowerment		**LOW** The project will target to have positive impact on GEEW, a detailed Gender Analysis will be developed at the fully developed project proposal stage. Women in seaweed farming communities will be targeted by specific activities (capacity building, direct support) and gender sensitive indicators to monitor and ensure equal access to water for women and men will be developed in the project proposal stage. A Gender Analysis and Action plan will be prepared for the project at the fully developed project proposal stage.

Core Labour Rights		**LOW** The project will ensure full compliance with the national labour act and the related regulations. Additionally, given the project's value-addition and processing of seaweed activities and the related equipment installation and deployment, standard operational health and safety (OHS) procedures will be introduced and followed throughout the project implementation. The specific potential risks and related mitigation measures will be assessed in the ESIA which will inform the environmental and social management plan (ESMP) for this project.
Indigenous Peoples		**LOW/MEDIUM** The ESMP will assess and confirm on the presence of indigenous peoples (IPs) in the project areas. The ESMP will further analyze any potential impacts on IPs and define specific actions to respect, conserve and maintain the knowledge, innovations and practices of indigenous and local communities, as well as to protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements. Should the presence of IPs be identified, all the above actions will be carried out through a Free, Prior and Informed Consent (FPIC) process to: (a) ensure a positive engagement of IPs in the project activities; (b) avoid adverse impacts, or when avoidance is not possible, minimize, or compensate for such effects; (c) tailor benefits in a culturally appropriate way. Based on the outcomes of the FPIC consultative process, the project team will consider whether there is a need to develop an Indigenous Peoples Plan (IPP), in accordance with UNIDO ESSPP.
Involuntary Resettlement		**LOW** The project activities should not require any resettlement either voluntary or involuntary. This issue will be assessed in the ESIA which will inform the environmental and social management plan (ESMP) for this project.
Protection of Natural Habitats		**MEDIUM** Seaweed farming may potentially impact natural ocean habitats (including coral reefs and mangroves and its role for fish populations); therefore, potential risks on these habitats will be analysed in the ESIA and related mitigation actions will be proposed in the ESMP .
Conservation of Biological Diversity		**MEDIUM** Seaweed farming may potentially impact biological diversity; therefore, the potential risks and related mitigation measures will be analysed as part of the ESIA and ESMP development.
Climate Change		**LOW** The project is proposed to increase the adaptive capacity of the communities in the selected areas to the effect of climate change which is affecting water quality and reducing water supply. Due to identified climate hazards a potential impact on infrastructure and services of heatwaves will be analysed as part of the ESIA and ESMP development. The project components will not introduce GHG in the atmosphere to contribute to the climate change, but rather use renewable energy which is a mitigation measure to climate change.

Pollution Prevention and Resource Efficiency		**MEDIUM** The project will provide clean and resource-efficient solutions (renewable energy, use of seawater) in the project area; however, two potential issues have been identified: • Desalination plants discharge brine, its impact on ecosystem needs to be analysed and specific management plan prepared (ESMP). Fertilizer in the seaweed farming could negatively affect the quality of seaweeds and the water quality around the farm where they dispose the fertilizer solution in the long term. Further research is needed to investigate the effects of fertilizer use on seaweed production. The identified risks and related mitigation measures will be analyzed through an ESIA which will inform the ESMP for this project.
Public Health		**LOW/MEDIUM** The project will target to have positive impact on public health through provision of fresh water, which will positively impact hygiene in the communities. Potential risks from project activities on the community health, safety and security from the perspective of COVID-19 pandemic will be duly considered as part of the ESIA and ESMP.
Physical and Cultural Heritage	The project activities will not pose any threat to physical and cultural heritage.	**NONE**
Lands and Soil Conservation		**LOW** An ESIA and ESMP will be developed for this project in detail for the identified risks.

Additionally following COVID related risks and mitigation strategies have been identified:

Risks	Risk Level	Mitigation Measures
Project cannot be executed as per expected timelines due to the pandemic, leading to a delay in implementation	Low	The Covid-19 pandemic did not prevent consultations on the project, as the lockdown periods were limited and the online meetings were well prepared and effective. The project will start in 2023, so until then there should already be low risk of COVID impacting the project.
Availability of technical expertise and capacity and changes in timelines	Low	The project will carefully anticipate and monitor all possible implications of COVID-19. This includes in particular the maintenance of containment regulations and their respective implications on the planning and working conditions of the various stakeholders as well as capacity changes with the implementing entity and other project partners. The local scope of the project will also reduce risk, and communication within the technical working groups and other forums such as the roundtables will help maintain an open dialogue between the different public and private parties.
Stakeholder Engagement Process	Low	A framework for stakeholder consultation is planned within the framework of the project, consisting of the representative steering committee, virtual meetings and technical assistance to the municipalities throughout the project. Also, the virtual mode worked well during the project development period and may be an alternative if this is necessary.

PART III: IMPLEMENTATION ARRANGEMENTS

As per endorsement letter, NDA has identified MinDA as executing entity and requested UNIDO for co-execution support. The rationale for this decision is based on the experience and successful setup of the Renewable Energy Technology to Increase Value-Added of Seaweeds in Tawi-Tawi (RETS) project implemented by UNIDO and co-executed by UNIDO and MinDA in the same area. The rationale for this setup is that the Tawi-Tawi is a special area with restrictions in access, where UNIDO has already experience and knowledge of local conditions and sensitivities. Additionally, currently there are no entities in the Philippines that have capacity and experience with executing AF projects. Within this project UNIDO would provide execution support to build MinDA's capacity to ensure the successful execution of the proposed AF project as well as potential future AF projects.

It has been initially agreed during the TWG meetings that MinDA will be heading the Project Steering Committee and UNIDO will provide support setting up the Project Management Unit. During the preparation of the full project proposal UNIDO, together with MinDA will look for specific execution partners capable of delivering project activities in the area, therefore the final project budget and share of execution cost may change.

UNIDO

UNIDO is the specialized agency of the United Nations, the organization's mandate is to support countries in their efforts to achieve Inclusive and Sustainable Industrial Development (ISID) and to foster the SDG 9, which **calls to build resilient infrastructure**, promote inclusive and sustainable industrialization, and encourage innovation. UNIDO focuses on creating shared prosperity, advancing economic competitiveness, and safeguarding the environment. The pillar "Safeguarding the environment'' creates a strong link with the Adaptation Fund's priorities, which creates opportunities for synergies between UNIDO strategic interventions and AF funding.

With Headquarters in Vienna and a field network of 47 regional and country offices around the world, UNIDO is present in the Philippines with its country office, 7 projects under implementation and more than 15 staff members.

Therefore, UNIDO as an experienced partner in project implementation and execution brings technical expertise to the project through its global network of development partners and organizations. UNIDO will also capacitate MinDA in accessing climate finance and Adaptation Fund project management policies.

MinDA

Mindanao Development Authority is a lead agency in coordinating and integrating development efforts that bring about accelerated socio-economic development of Mindanao. This is done through catalyzing active and extensive participation of all sectors in this development process. MinDA provides strategic planning and integrated programming of various peace and socio-economic development programs and projects in Mindanao and works for inter-regional/Mindanao-wide linkages and synergism of Mindanao stakeholders in pursuing Mindanao's advocacy agenda.

Therefore, MinDA brings to the project value of stakeholder engagement and knowledge of local needs and conditions, assuring that the proposed project will reflect local communities' needs.

Project Steering Committee

It is proposed for the PSC to meet twice a year, after the project start. Members of the PSC (MinDA, BARMM government, Tawi-Tawi province, LGUs…) will nominate staff to participate in the PSC meetings and coordination with PEE on day-to-day basis.

Main PSC tasks and responsibilities include:

- Biannual meetings,
- Advisory role to the Project Executing Entity
- Approvals of project budget and annual workplans,
- Decisions on the key project issues.

Each PSC meeting will be concluded with decisions taken and meeting minutes serving as a guidance for project execution.

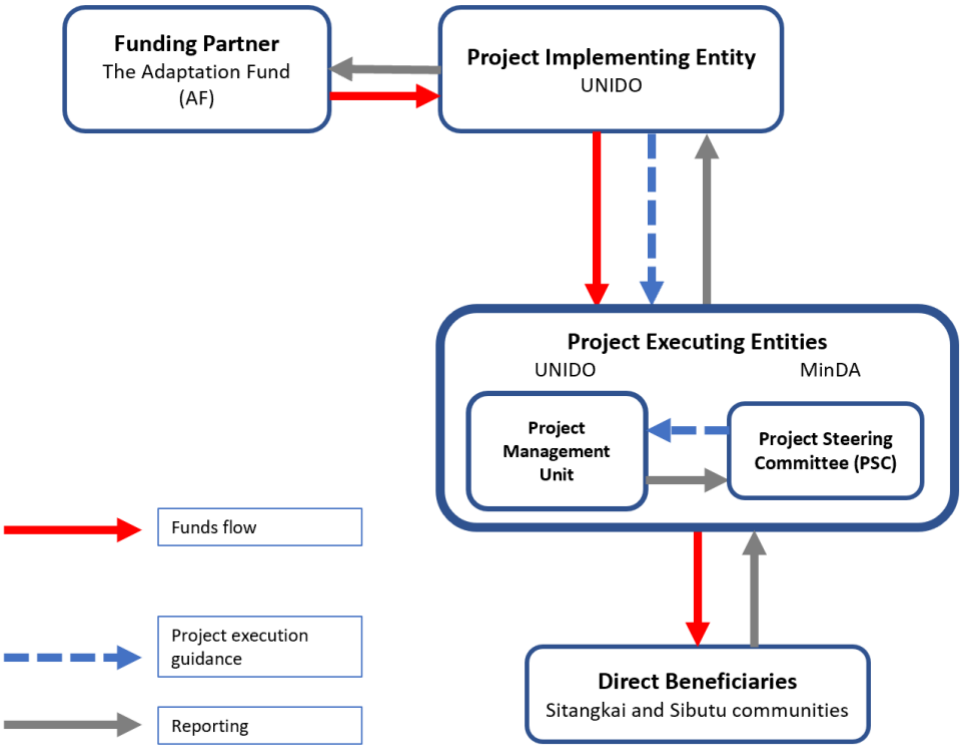


Figure 12. Proposed project implementation arrangements.

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

A. Record of endorsement on behalf of the government[2]

Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:

Atty. Analiza Rebuelta-Teh *Undersecretary for Finance, Information Systems and Climate Change* *Department of Environmental and Natural Resources (DENR)*	*December 2, 2021*

B. Implementing Entity certification

Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme 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 (Ambisyon Natin 2040, The Philippine Development Plan 2017-2022, Nationally Determined Contributions, National Framework Strategy on Climate Change, National Climate Change Action Plan, National Adaptation Plan, National Disaster Risk Reduction and Management Plan, Philippine Water Supply Sector Roadmap) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender 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/programme.	
Name & Signature Implementing Entity Coordinator — Akos KOSZEGVARY	
Date: *21.12.2021*	Tel. and email:+431260264573 a.koeszegvary@unido.org
Project Contact Person: Ms. Katarina BARUNICA	
Tel. And Email: +43 1 26026 3803; k.barunica@unido.org	

[6] 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.

Republic of the Philippines
Department of Environment and Natural Resources
Visayas Avenue, Diliman, Quezon City, 1100
Tel. Nos. (632) 929-66-26 to 29 (632) 929-62-52
929-66-20 929-66-33 to 35 929-70-41 to 43

Adaptation Fund
https://www.adaptation-fund.org

In my capacity as the Philippines Designated Authority for Adaptation Fund, I am endorsing the proposal entitled "Water-Energy-Food Nexus Project to Address and Adapt to Climate Change Impacts in Tawi-Tawi" of the Mindanao Development Authority (MinDA) for funding consideration under the Adaptation Fund. The proposed initiative is being endorsed in view of its merits in targeting the water security issue in two island municipalities of one of the poorest provinces of the Philippines. The project will seek to increase the adaptive capacity of the seaweed farming communities through provision of reliable, climate resilient access to water infrastructure and services. This initiative is also seen to contribute to long-term adaptation solutions and strategies for the communities by building awareness and ownership of adaptation and climate risk reduction processes within target local communities and local government units as well as in the wider region.

I further affirm that the country's Department of Environment and Natural Resources (DENR) was consulted with respect to the Water-Energy-Food Nexus Project to Address and Adapt to Climate Change Impacts in Tawi-Tawi" proposal. It is understood that during the project's further development and implementation, we will be collaborating with the Mindanao Development Authority and other government and other institutions working on climate change mitigation, adaptation and disaster risk management. Further we approve of the "co-execution" of the project by MinDA and the United Nations Industrial Development Organization (UNIDO).

Date: DEC 0 2 2021

Signature:

ATTY. ANALIZA REBUELTA-TEH
Undersecretary for Finance, Information Systems and Climate Change
Department of Environment and Natural Resources (DENR)

ANNEX I. Consultative process – Technical Working Group

UNIDO **MinDA**

Water-Energy-Food Nexus Project to address and adapt to climate change impacts in Tawi-Tawi

Adaptation Fund Project Idea for the Philippines

Terms of Reference for the Technical Working Group for the project formulation

1. Introduction

This document defines Terms of Reference (TOR) for a Technical Working Group (TWG) for the formulation of the "Water-Energy-Food Nexus Project to address and adapt to climate change impacts in Tawi-Tawi" project, to be submitted for funding by the Adaptation Fund. The Adaptation Fund finances projects and programmes that help vulnerable communities in developing countries adapt to climate change. Initiatives are based on country needs, views and priorities.

The project idea for a climate adaptation intervention in the Philippines is a result of initial discussions between the United Nations Industrial Organization (UNIDO) and the Mindanao Development Authority (MINDA) and "Renewable Energy Technology to Increase Value-Added of Seaweeds in Tawi-Tawi (RETS)" Project (funded by the European Union, currently under implementation).

Building on the outputs of the RETS project, the proposed adaptation action will facilitate the implementation of resilient electricity and water supply systems in Sitangkai and Sibutu. Making electricity and water supply available will provide two basic needs of households and communities to increase their quality of life and increase the production and productivity of high-quality seaweeds, which is their main source of livelihood. These interventions are aimed at increasing the resilience of seaweed farming communities to climate impacts, in particular sea level rise, which threatens their lives and livelihood, as well as their contribution to mitigating these climate impacts through seaweeds.

2. Roles and responsibilities

Technical Working Group (TWG) purpose is to provide advice and endorsement during the project formulation phase for the development of the Project Concept Note, as required by the Adaptation Fund.

2.1 Advisory

- Advise on the design of outputs and activities/deliverables of the project;
- Provide technical advice/input for the project concept.

2.2 Endorsement

- Provide written approval / no objection letter for the project concept.

3. Composition

The TWG will be composed of a member from the following entities:

- Mindanao Development Authority (MINDA) - Chair
- United Nations Industrial Development Organisation (UNIDO) - Co-Chair
- Climate Change Commission – member
- Department of Energy - member
- Department of Environment and Natural Resources – member
- Department of Science and Technology – member
- BARMM Ministry of Environment and Energy - member

- BARMM Ministry of Agriculture, Fisheries and Agrarian Reform – member
- BARMM Ministry of Science and Technology – member
- PLGU of Tawi-Tawi – member
- Mindanao State University Tawi-Tawi - member

Appointed TWG members should nominate representatives for the working group which would be capable of:

- Decision-making on behalf of the member organisation,
- Providing technical capacity for coordination with the TWG and review of the project documents.

4. Rules of Procedure

1. During the project formulation phase (until December 2021), the TWG meetings will be convened on as needed basis, by the Chair. It is envisaged that at least one TWG meeting will take place (27 September 2021 – tentative date).
2. The meetings will be held in online format.
3. Each meeting will be concluded with decisions taken and meeting minutes serving as a guidance for project formulation.
4. The working language of the TWG is English.
5. The TWG may establish sub-working groups, as required, to facilitate its work.
6. Representatives of the TGW will be the chair and the secretary of TWG.

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Minutes of the Meeting

Subject of the meeting:
Technical Working Group Meeting for the Adaptation Fund project "Water Energy Food Nexus Project to address and adapt to climate change impacts in Tawi Tawi"

Date and place of the meeting:
Wednesday, 25 August 2021 2:00 pm
Virtual Meeting

Meeting objective: Consultation of the project idea for the Adaptation Fund. Establishment of the Technical Working Group for the project formulation.

ATTENDEES:

UNIDO
Ms. Rana Ghoneim – Chief, Energy Systems and Infrastructure Division, UNIDO
Mr. Teddy Monroy – Country Representative, UNIDO
Ms. Jillian Revadulla-Bondoc - Country Office, UNIDO
Ms. Katarina Barunica Spoljaric – Project Manager, UNIDO
Mr. Tomasz Pawelec – International Consultant, UNIDO
Mr. Jessie L. Todoc – National Consultant, UNIDO
Ms. Pamela Cea-Borlaza – National Project Manager for the RETS Project, UNIDO
Ms. Katrina Baris – National Consultant, RETS project team, UNIDO

Mindanao Development Authority
Asec. Romeo M. Montenegro
James Doldolia
Raymond Peter Esperat
Rogelio Vicetacion
Joan Barrera
Madania Malang – Casinto
Fatma Idris

Department of Energy (DOE)
Dir. Jesus Tamang
Hershey Dela Cruz
S. Magnolia Olvido
Ma. Angelica Eunice R. Peralta

Department of Environment and Natural Resources (DENR)
Elenida Basug
Conrado Bravante
Elma Eleria
Micah De Leon
Joan Flores

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Climate Change Commission (CCC)
Jean Paula Regulano
Jacir Bebing

Department of Science and Technology
Representative of Dir. Martin A. Wee

PLGU of Tawi-Tawi
Gov. YSHMAEL I. SALI

MSU Tawi-Tawi
Zayda Halun
Richard Muallil

Ministry of Agriculture, Fisheries and Agrarian Reform
Pen Patarasa
Rene Regaspi
Engr. Gundarangan

Ministry of Environment, Natural Resources and Energy
Engr. Eduardo Longakit

SUMMARY OF THE MEETING

1. **Opening of the meeting**

- Asec. Romeo M. Montenegro convened the meeting and welcomed the attendees providing a general background to the initiative and the work of MinDA.
- Ms. Rana Ghoneim gave opening remarks on behalf of UNIDO, stressing good cooperation with all key stakeholders under the RETS project.

2. **Presentation of the project idea and Adaptation Fund requirements**

- Ms. Katarina Barunica opened the presentation of the project idea with a background of the currently ongoing RETS project thanking again all the stakeholders for good cooperation.
- UNIDO presented requirements of the Adaptation Fund and the submission process and timelines.
- After briefly discussing the Adaptation Fund requirements UNIDO presented the project concept together with next steps for the project formulation.

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3. Discussion

The discussion has been moderated by MINDA. Key highlights of the discussion:

- Representative of the DENR inquired why does the project cover very widely the communities in the region (activities in the Logframe) instead of focusing only on the indicated project site (Sibutu and Sitangkai). The response from the project team was that the soft activities may cover wider region, not only the specific project site, but the investment will be located only on the two islands in Tawi Tawi. DENR representative declared that DENR would like to see the activities of the project upscaled to other seaweed producing regions with similar issues and to learn from this project. The upscaling of the activities would be an indicator of the project success. But the project proposal should focus the main activities on the proposed site.
- Representative of DENR inquired how the project will address gender issues, because the problems which the project addresses are all women's issues (water access, food security, sanitation etc.). Prof Zayda from the MSU Tawi Tawi mentioned about a specific study on gender issues in the seaweed farming communities and its results (~50% of farmers are women, they don't get paid the same as men), the results and guidance from the MSU will be available for the project design – these issues can be addressed. DENR mentioned a gender sensitive value chain training course which can be useful. UNIDO informed that a Gender Analysis will be prepared for the project and all relevant requirements of the Adaptation Fund on the gender (Gender Policy) will be taken into consideration in the project design.
- Representative of the DOE requested some clarification on the development of regulations and standards. There are standards already in place for infrastructure, requirements for food production etc (including energy efficiency and other relevant laws in force in the Philippines). Relevant standards and regulations need to be addressed in project activities. The component 2 deployment of the technology is really welcomed by the DOE. For the component 3 there is a question how to increase the financing support available to the local communities – the project lacks specific output on the financing support. UNIDO stressed that all regulations will be considered for the baseline development and taken into consideration for the sustainability strategy. For the financing support the activities will result in concrete outputs – climate-smart investment plans which will help to get financing for projects on the ground.
- DOST representative expressed that the DOST is not sure yet how they will be able to participate in this project but are willing to assist with the project in the context of technology development. There are some projects by the DOST for seaweed farmers. BARMM-DOST should be included as a stakeholder. These has been acknowledged by MINDA.
- CCC representative provided information on the endorsement procedure which will entail a complete evaluation of the project concept by offices of the CCC to ensure that a holistic approach is taken into consideration. Upon receiving of the final document the CCC will evaluate and facilitate the endorsement by the

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commissioner. CCC representative also asked DENR when the endorsement from CCC will be needed. DENR representative responded that NDA will request the DOE and the CCC for official endorsement for the project before providing official Philippine government endorsement to the project to the Adaptation Fund. There is also a concern that possibly endorsement of the Department of Finance would be needed to the project, but currently this is not yet clear.

- Representative of the MSU Tawi Tawi expressed his concern on the technical issues of the project: how the infrastructure will be made accessible to the communities – where it will be placed? These are dispersed communities all over the islands. How will the project ensure there is a value added for the communities? The response is our water system feasibility study developed by the RETS. Also, the question is how the project will respond to environmental issues of the seaweed farming – some of the activities may be harmful to the environment. MIDNA representative replied that some regions will be targeted first and other will be considered as a scaling up activities, also the project should focus on providing value added services to the communities and creating centres serving a larger area to achieve a certain economy of scale. During the discussion it has been mentioned that a detailed water study is being prepared for Sibutu and Sitangkai within the RETS project and it will formulate a baseline for the project to identify the best locations and solutions to be implemented. Regarding the environmental impact UNIDO explained that the project will undergo environmental assessment to consider all relevant issues and propose specific risk mitigation strategy.
- Representative of the DOE inquired if the TAWELCO be included in the project. UNIDO replied that TAWELCO is a partner of the RETS project and UNIDO will work closely with them for the project implementation. DOE expressed that it is important to account this type of projects into country's renewable energy production target.
- DOE requested to revise figure 3 in the PIN – "climate change mitigation and adaptation" and "climate change impacts". This has been acknowledged by UNIDO.
- DOE also stressed that capacity building/trainings should be provided on the operations and maintenance of the deployed equipment (as project activities).
- MINDA inquired if water treatment could also be a part of this project. UNIDO replied that every effort leading to water conservation could be considered as adaptation activity within the project.
- DENR stressed that the project should be aligned with national priorities and all relevant stakeholders should be identified. MINDA acknowledged this issue.
- DOE representative that currently there are no issues that could prevent DOE form endorsing the project.

4. Way forward

The following has been agreed by the participants at the closure of the meeting:

- MINDA will coordinate the Technical Working Group – will take care of communication & coordination of the work.
- UNIDO will prepare Terms Of Reference for the TWG.
- UNIDO will provide technical inputs and formal communication if needed and will work together with MINDA on the project development.
- Mr James Doldolia – is a focal point for the project at MINDA.
- Ms Katarina Barunica Spoljaric is a responsible project manager at UNIDO.

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2nd Technical Working Group Meeting on the Tawi-Tawi Adaptation Fund Proposal

Minutes of the Meeting

Subject of the meeting:
2nd Technical Working Group Meeting on the Tawi-Tawi Adaptation Fund Proposal "Water Energy Food Nexus Project to address and adapt to climate change impacts in Tawi Tawi"

Date and place of the meeting:
Friday, 01 October 2021 3:00 pm
Virtual Meeting

Meeting objective: Presentation and consultation of the project concept for the Adaptation Fund.

ATTENDEES:

CCC:
Ms. April Deunnice Simpao
Ms. Jean Paula Regulano

DENR:
Ms. Elma Eleria
Ms. Eda Soriano

DOE:
Mr. Angelou Austria

DOST Region IX:
Engr. Mahmud L. Kingking
Mr. Ricardo J. Apolinario III

MSU-TCTO:
Dr. Sitti Zayda B. Halun
Prof. Karen Joy B. Serag

BARMM – MAFAR:
Mr. Pendatun S. Patarasa
Mr. Aidarus Nami

BARMM – MOST:
Dir. Shirmal S. Mudjahiron
Mr. Ferdauzia N. Bahad

BARMM – MENRE:
Dir. Nasiri Abas
Mr. Eduardo Longakit

PLGU of Tawi-Tawi:
Gov. Yshmael I. Sali
Mr. Francis Marcial

MinDA:
Ms. Joan Barrera
Mr. James Doldolia
Mr. Rogelio Visitacion
Mr. Carlos Cerezo
Mr. Paul Tolentino

UNIDO:
Ms. Katarina Barunica Spoljaric
Mr. Tomasz Pawelec
Ms. Pamela Cea-Borlaza
Ms. Katrina Baris
Mr. Jessie L. Todoc

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SUMMARY OF THE MEETING

1. **Opening of the meeting**

- Ms. Joan Barrera from MinDA welcomed TWG members on behalf of ASEC Romeo Montenegro and introduced objectives of the meeting.
- Mr. John Maynard (MinDA) introduced the attendees of the meeting.

2. **Presentation of the project concept for the Adaptation Fund**

- Mr Tomasz Pawelec (UNIDO) presented the project concept, proposed project implementation structure, and proposed next steps for the TWG. The presentation stressed the elements that required specific inputs from the TWG members.
- At the beginning of the presentation specific guidelines on providing feedback to the project concept were presented (details were included in the draft project concept shared with the working group).
- Specific issues discussed during the project concept presentation were:
    - Selection of the project site – there were no comments regarding the selected site. TWG acknowledged the site. It had been stressed that in Sitangkai water access is a main problem.
    - Selection of the target groups – it was noted and commented by the TWG that the target groups (seaweed farmers/communities of seaweed farmers) requires development assistance – increasing their resilience through provision of water access and increasing their economic development is the priority of the BARMM government.
    - The climate adaptation rationale of the project – no comments were made to the presented rationale.
    - Project objectives (main objective and specific objectives) – no comments made.
- Additionally, UNIDO asked for assistance in the following areas:
    - Data on climate change impacts on the project area
    - Socio-economic data for the communities
    - Data on gender issues in the project area
    - Data on environmental aspects of seaweed farming in Tawi-Tawi.
- Proposed project implementation structure was presented and discussed, with UNIDO being the implementing agency and coordinating the Project Management Unit, and MinDA hosting and heading the Project Steering Committee.

3. **Discussion**

The discussion was moderated by MINDA. Key highlights of the discussion:

- The issue of seaweed farmers organisation was raised – currently the farmers are not organised in any significant way (or as farmer cooperatives). There was a USAID funded project focused on organising farmers. The lesson learnt is that

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the farmers organisations are not sustainable, something needs to be done to make them sustainable. It was advised that MAFAR-BARMM could be engaged in developing farmers organisations. The role of the cooperatives is important in building value of the produced seaweed.

- The water supply study, undertaken within the RETS project was discussed – its scope and timeline. Also, the issue of water system management was raised by the group. It was suggested that within municipalities water cooperatives should be established, which would manage the water distribution system and provide proper maintenance.
- Within the project scope there should be capacity building activities, including training on the tools for water maintenance.
- It was stressed by the group that the lessons learn by the project should be documented in detail to enable easy replication of this project into other locations. The project management should make sure that the LGUs would be properly capacitated during the project.

4. Way forward

The following next steps have been proposed:

- Deadline for provision of comments to the concept by TWG members 14 October
- Finalization of the AF Project Concept by 31 October, submission of the concept to CCC + DOE for review and endorsement (by 1 November). MinDA will be sending letters to stakeholders.
- Submission to NDA for endorsement - 15 November (UNIDO).
- November/December – UNIDO internal review and approval process for the AF concept.
- January 2022 – submission of the concept to the Adaptation Fund

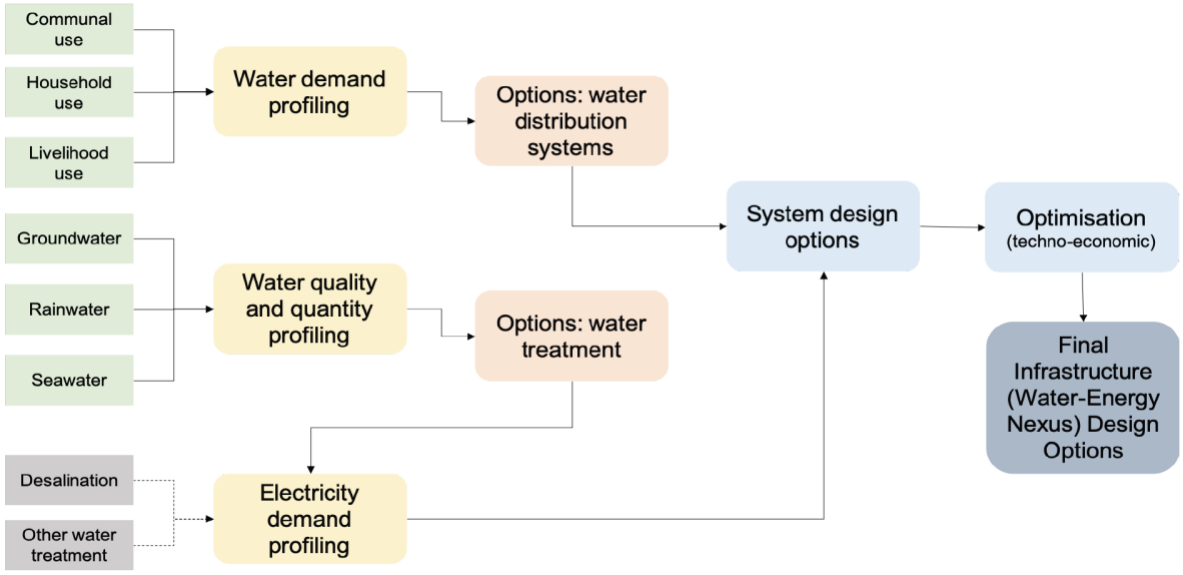
TWG members have been informed to submit their comments by 14 October.

ANNEX II. Scope of water system feasibility study

The water system feasibility study for Sitangkai and Sibutu is being developed as part of the RETS project. The study will be ready by June 2022. Results of the study will be utilised to finalise adaptation project design.

Scope of work

For the feasibility study profiling will be conducted on water demand, water quality and quantity, and electricity demand. Water demand profiling will be done through a survey of the households in Sibutu and Sitangkai, where current and projected consumption for communal, household, and productive (e.g. seaweed farming) uses are established. Results will facilitate the design of possible water distribution systems to support the projected demand of the households. Water quality and quantity profiling will be done to determine options for water supply source, treatment, and distribution, which will then facilitate the profiling of additional electrical energy needs for the two islands. System design options are established based on possible water distribution systems and estimated electricity demand. A techno-economic optimisation will be carried out to determine which design options for water-energy systems will provide the best benefit cost scenarios.



Data collection and processing

Data needed for water demand profiling, water quality and quantity profiling, and electricity demand profiling, are collected through secondary data analysis, surveys and interviews with key stakeholders, and preliminary technical data collection, as needed for initial validation. Appropriate software tools are used to fast-track system design and optimization procedures.

Deliverables and Timeline

Activities	Expected outputs	Month 1				Month 2				Month 3				Month 4				Month 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Project startup, Stakeholder Mapping	Demographic profiles																				
Survey instrument development and Ethics Review	Survey instrument; Ethics Approval																				
Survey deployment	Survey data																				
Needs analysis; preliminary technical analysis; risk analysis	Projected water demand; water quality and quantity analysis; Water distribution systems; risk analysis report																				
Water quality and quantity analysis	Inventory of current water supply systems; Analysis report and possible treatment options																				
Load demand estimation	Load profile (dependent on possible treatment and distribution options)																				
Water-energy nexus analysis	System design options (water distribution + RET)																				
Techno-economic analysis and optimisation	Optimal system design options																				
Report Writing and documentation	Progress Reports																				
Report Presentation and submission	Final Report with design options (and presentation slides as needed)																				

UNIDO Environmental and Social (E&S) Screening Template

The UNIDO Environmental and Social Safeguards Policy and Procedures (ESSPP), are applicable to all UNIDO projects and programmes submitted to the AF, GEF and the GCF and all other UNIDO projects and programmes as relevant. It requires that UNIDO projects and programmes undergo environmental and social risk (E&S) assessments. This helps UNIDO decide whether a project or programme should be supported and, if so, the way in which environmental and social issues should be addressed in its development and implementation. To complete the E&S screening, basic understanding of the ESSPP is required. As such, project development teams are recommended to thoroughly review the ESSPP. ESS categorisation guidance is provided in Annex 1.

The objective of the **E&S Screening Template** is to help UNIDO project development teams in a two-step approach to (i) determine the appropriate environmental and social risk category of a proposed UNIDO project or programme, and (ii) assess whether the project's or programme's activities pose any specific risks covered by ESSPP OS 2 to OS 10.

Once the E&S screening template is completed, the project development team will be in the position to plan the resulting required environmental and social assessments (e.g., ESIAs and ESMPs, or ESMPs). The completed and signed **E&S Screening Template** should be attached to the concept draft[1] and/or project document submitted in accordance with UNIDO project cycle procedures.

Title of the proposed project/programme:	Water-Energy-Food Nexus to address and adapt to climate change impacts in Tawi-Tawi
UNIDO Project Number:	210194
Proposed donor(s) for the project/programme:	Adaptation Fund
Name and function of the submitter:	Katarina Barunica Spoljaric, Industrial Development Officer
Department/Division of the submitter:	ENE/ESI
Proposed ESS category:	B
Signature & Date of submitter:	 Katarina Barunica Spoljaric, 16/11/2021
Comments by Compliance Officer:	As per UNIDO Environmental and Social Safeguards Policies and Procedures (ESSPP), this project has been categorized as "Category B". Category B projects are likely to have some potential adverse impacts on human populations or environmentally important areas. As a result, and in line with the Adaptation Fund (funding partner) requirements, an Environmental and Social Impact Assessment (ESIA) and an Environmental and Social Management Plan (ESMP) should be developed during the project preparation stage and be submitted to PFC/PPC/PCD for review. Given the particular socio-economic context of this project, as well as the potential involvement of indigenous peoples, the ESIA and ESMP will also undertake a free, prior and informed consent consultative process (FPIC). The ESIA and ESMP will remain dynamic documents and will be

[1] Obligatory for all AF, GEF and GCF projects and advisable for any other projects receiving preparatory funding.

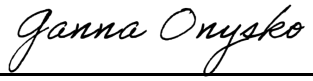
	periodically updated and verified, as needed, throughout the project life cycle.
Signature & Date of Compliance Officer:	Ganna Onysko, 7 January 2022 

TABLE 1 - Screening for E&S Impact Potential The aim of the environmental and social screening process is to determine if and what environmental and social review and management is required, quickly identifying those projects and programmes no potential environmental and social issues exist, so that only those with potential environmental and social implications will be required to undergo more detailed assessments.			
Please respond to the below questions with "No" or "Yes", taking note of the guidance provided.			
Guiding principles	**No**	**Yes**	**Guidance**
1. Has a combined environmental and social impact assessment/review that covers the proposed project/programme already been completed by the National Partner, Project Execution Partner, or other donor(s) within the last year?	*NO*		**If you answered "yes"**, please refer to the table in Annex E of the ESSPP to identify whether the existing documentation meets UNIDO's ESSPP requirements. Please attach existing documentation and send to ess@unido.org for further guidance.
2. Would the proposed project/programme potentially involve or lead to adverse impacts on the situation of women, men, girls and boys? This includes adverse impacts on gender equality, gender-based violence (GBV) and/or sexual exploitation and abuse (SEA).	*NO*		For definitions of GBV and SEA, please refer to Annex I of the ESSPP. **If you answered "yes"**, kindly contact the UNIDO Gender Coordinator at gender-coordinator@unido.org as well as ess@unido.org for further guidance.
3. Has a climate risk assessment for the proposed project/ programme been carried out?	*NO*		**If you answered "yes"**, please provide this assessment to ess@unido.org. **If you answered "no",** please refer to Table 3 and complete in line with guidance provided.
ESS categorization	**No**	**Yes**	**Guidance**
4. Is the proposed project/programme*:* - Likely to infringe on the protection of a **critical habitat**[2]? - Introducing or using potentially **invasive, non-indigenous alien species**? - Manufacturing, trading, and/or using pesticides and/or chemicals **subject to international action bans or phase-outs**[3] (OS5)?	*NO*		**If you answered "yes"**, the proposed project will be categorized as "Category NO PROJECT *".* It is **non-compliant with UNIDO's ESSPP**. National stakeholders and project proponents will be informed accordingly that UNIDO cannot support the development of this project.

[2] Please refer to Annex I for a definition of 'critical habitat' and other terms used in Table 1.
[3] For example, DDT, PCBs and other chemicals listed in international instruments such as the WHO Recommended Classification of Pesticides by Hazard (Classes IA, IB, or II); the Stockholm Convention on Persistent Organic Pollutants; or the Montreal Protocol.

- **Causing involuntarily resettlement or physical and economic displacement of** populations, including Indigenous People? - Altering, damaging or removing any **cultural heritage and/or sites**? - Using **forced, trafficked or child labour?** - Employing **children** under the age of 18 in hazardous work?			Alternatively, further discussions and redesign of the project is required for the project to be reassessed for UNIDO support.
5. Is the proposed project/programme scope including: - Actual establishment and/or relocation of a **new large-scale facility** such as a large-scale manufacturing and/or processing plant, landfill site, dam above 15m in height, etc.? - Actual establishment and/or relocation of **industrial zones or industrial parks**? - Deploying **new large-scale** technology installations such as large-scale waste(water) treatment plants, large-scale power generation and distribution systems, etc.? - Activities that would **adversely or seriously affect** indigenous peoples (IP) – including those living in voluntary isolation – rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and culture or heritage inside and/or outside the project area? - Activities that require an **ESIA by national law/regulations**?	*NO*		Please refer to Annex 1 for further details and examples. **If you answered "yes"**, the proposed project will be categorized as "**Category A**". **Complete** Tables 2&4 and attach to the UNIDO project documentation.
5. Is the proposed project/programme scope including: - **Upgrading/optimization of processes/introduction of alternative technologies** at an **existing facility** such as treatment and disposal of POPs at existing facilities, pilot resource efficient technology transfer and installation at existing facilities, etc.? - Deploying **new small-scale technology installations** such as limited bioenergy or other small- and medium-scale renewable		*YES*	Please refer to Annex 1 for further details and examples. **If you answered "yes"**, the proposed project will be categorized as "**Category B**". **Complete** Tables 2&4 and attach to the UNIDO project documentation.

energy installations, small-and medium scale agro- and food-processing installations, etc.?			
6. Is the proposed project/programme scope including: - Development of **feasibility studies,**[4] **roadmaps, inventories, strategies, business plans**, **studies**, etc.? - Provision of **policy advice, capacity building / awareness raising**, etc.? - Organisation of forums, etc.? - Setting-up of **financial mechanisms, accelerators/incubators, business models**, etc.?	*NO*		Please refer to Annex 1 for further details and examples; particularly regarding the requirements pertaining to mechanisms/schemes/models to be set-up. **If you answered "yes"**, the proposed project will be categorized as "**Category C**". **Complete** Tables 2&4 and attach to the UNIDO project documentation.

[4] If a full feasibility study is to be developed for a planned Category A project, an ESIA needs to be included (if not already undertaken or to be undertaken by another project stakeholder).

TABLE 2 - E&S Screening & Categorization Outcome	
Based on the answers provided in Table 1, please select from the following:	
☐ **Category NO PROJECT**	The proposed project/programme is non-compliant with UNIDO's ESSPP OS2/OS3/OS5/OS6/OS8. Further discussions, alternative design, and reassessment of the project is required or further project development will be stopped.
☐ **Category A**	The proposed project/programme is likely to induce significant and/or irreversible adverse environmental and/or social impacts that are sensitive, diverse, or unprecedented. A full ESIA and ESMP will need to be completed during Project Formulation or Inception.
X **Category B**	The proposed project/programme is likely to have less adverse impacts on human populations or environmentally important areas than those of Category A projects. Likely impacts will be few in number, site-specific, and few if any will be irreversible. An ESMP will need to be completed during Project Formulation or Inception.
☐ **Category C**	The proposed project/programme is likely to have minimal or no adverse social and/or environmental impacts. No further specific environmental and/or social assessment is required during Project Formulation or Inception. Additional requirements may, however, still apply.[5]

[5] Please refer to Annex 1 for further details.

TABLE 3 – Climate Risk Consideration of climate risk is an important aspect of project/programme design for the AF, GEF and GCF and may also be requested by other funding partners. As a minimum, the below questions would need to be answered at the project concept stage. Additional analysis can be provided during the preparatory phase. You may want to consult the following publications and tools: **STAP guidance on climate risk screening**[6] **Climate Expert – specifically for SMEs and Industrial Zones**[7] **World Bank Climate and Disaster Risk Screening Tools**[8]	
Please respond to the below questions, taking note of the guidance provided.	
(i) Has the **sensitivity to climate change**, and its impacts, been assessed? Consider to include: • Details of the historical (past to current) and the range of projected future climatic conditions in the project location.[9] • Information on the overall vulnerability (the product of exposure, sensitivity and adaptive capacity) of targeted natural resources in the project area to climate change. • Information on the vulnerability and exposure of the local communities in the project area to a changing climate. • Information on the role of climate change as a driver to the problem being addressed, if applicable. • Details on how climate and non-climate stressors might interact to exacerbate climate risks.	**Please provide details:** This project is a climate change adaptation project, therefore, addressing sensitivities to climate change is at the core of the project's design. Climate change impacts have been analysed and presented in the project concept (pp. 15 – 19). More detailed analysis will be done at the project proposal development stage.
(ii) How will the **project's objectives or outputs be affected** by climate risks **over the period 2020 to 2050**, and have the impact of these risks been addressed adequately? Consider to include:	**Please provide details:** This project concept is targeting climate adaptation therefore specific sensitivity to climate change is the core of the project. It has been analysed and presented in the project concept (pp. 12 – 15). The proposed interventions are focusing on reducing the

[6] Available at: https://stapgef.org/sites/default/files/publications/Climate%20Risk%20Screening%20web%20posting.pdf
[7] Available at: https://www.climate-expert.org/en/home/
[8] Available at: https://climatescreeningtools.worldbank.org/
[9] Projected future climatic conditions and possible impacts include temperature, precipitation, drought, flood, sea-level rise, ocean warming, ocean acidification, shifting seasonal patterns, heatwaves, storm surges, winds, frequency and intensity of extreme events, etc.

• Information on how the targeted project components (e.g., forests, wetlands, rivers, semi-arid croplands, parks, mangroves, chemicals, fishery, etc.) will be impacted by climate change and the level of severity. • Specific information on how different levels of projected climate change impacts, including climate variability, in the project location can affect the efficacy of proposed interventions? • Information on how the proposed interventions may contribute to reducing the vulnerability to climate risks. • Evaluation of the possibility that the proposed interventions increase vulnerability to climate risks or lead to maladaptation, and measures for preventing this.	vulnerability of the project and its target areas to climate risks and variability (pp. 12 – 19 and Part II of the project concept). More detailed analysis and design will be done at the project proposal development stage.
(iii) Have **resilience practices and measures** to address projected climate risks and impacts **been considered**? How will these be dealt with? Consider to include: • How proposed climate risk management options address the identified current and projected climate risks. • Details of the resilience enhancement practices, measures, and technologies proposed to manage identified current and projected climate risks. • Evaluation of how to manage adaptively and project implementation proceeds. • Information on the feasibility, effectiveness, tradeoffs, and co-benefits of the proposed climate risk management option, and its alignment with project objectives and expected outcomes.	**Please provide details:** This project concept is targeting climate adaptation therefore specific sensitivity to climate change is the core of the project. It has been analysed and presented in the project concept (pp. 15 – 19). The proposed interventions are focusing the vulnerability of the project and its target areas to climate risks and variability (pp. 12 – 19 and Part II of the project concept). Specific components addressing those issues include Component 1. Deployment of a resilient water supply systems integrated with upgraded RE infrastructure in Tawi-Tawi, Component 2. Upgrading of seaweeds production in Tawi-Tawi (pp. 20-22). More detailed analysis and design will be done at the project proposal development stage.

(iv) What **technical and institutional capacity**, and **information**, will be needed **to address climate risks** and resilience **enhancement measures**? Consider to include: • Details of the technical and institutional capacities needed to address identified climate vulnerabilities and design resilience enhancement measures. • Information on the financial implications of the proposed climate vulnerability management option. • Mechanisms for evaluation of the success of mechanisms to reduce vulnerability and improve resilience.	**Please provide details:** This project concept is targeting climate adaptation therefore specific sensitivity to climate change is the core of the project. It has been analysed and presented in the project concept (pp. 15 – 19). The proposed interventions are focusing the vulnerability of the project and its target areas to climate risks and variability (pp. 12 – 19 and Part II of the project concept). Specific components addressing those issues include Component 1. Deployment of a resilient water supply systems integrated with upgraded RE infrastructure in Tawi-Tawi, Component 2. Upgrading of seaweeds production in Tawi-Tawi, Component 3. Awareness and capacity building at local level in Tawi-Tawi (pp. 20-23). More detailed analysis and design will be done at the project proposal development stage.

TABLE 4 - Identification of E&S Risks (OS-specific questions)				
Project/Programme-Specific Questions	**Yes**	**No**	**Relevant Safeguards to be Triggered & Additional guidance**	**If answered "yes", detail the specific project activities and potential E&S impacts that pertain to this OS[10]**
1. Could the project/programme directly or indirectly undertake any activities located in natural habitats?	YES		OS 2: Protection of Natural Habitats and Biodiversity. *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 2* *- ESSPP Annex I (for definition of natural habitats)*	Seaweed farming may potentially impact natural ocean habitats (including coral reefs and mangroves and its role for fish populations); therefore, any potential risks on these habitats will be analysed as part of the Environmental and Social Impact Assessment (ESIA) and related mitigation actions will be proposed in the Environmental and Social Management Plan (ESMP).
2. Could the project/programme directly or indirectly use natural resources, e.g., plantation forestry, commercial harvesting, agriculture, livestock, fisheries and aquaculture?	YES			The project will be affecting aquaculture (seaweed farming) with a goal of increasing it's scale and sustainability. The ESIA and the ESMP will identify specific potential negative impacts of project activities on the environment (biodiversity, key ecosystems, and natural habitats) and propose related mitigation measures to address such risks.
3. Could the project/programme potentially involve land acquisition?		NO	OS 3: Involuntary Resettlement and Land Acquisition OS 10: Community Health, Safety and Security *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 3 and OS 10* *- ESSPP Annex I (for definition of land use categories)*	
4. If the project/programme involves land acquisition, would this potentially require a conversion of the land use category?		NO		

[10] This might include both environmental and social opportunities that could be seized to strengthen the project, as well as risks that need to be managed. Information provided will inform the development of the TOR for the ESIA and/or ESMP.

TABLE 4 - Identification of E&S Risks (OS-specific questions)				
Project/Programme-Specific Questions	**Yes**	**No**	**Relevant Safeguards to be Triggered & Additional guidance**	**If answered "yes", detail the specific project activities and potential E&S impacts that pertain to this OS[10]**
5. Could indigenous peoples (IP), including those living in voluntary isolation, be present in the project/programme's area of influence and would the project/programme have any impact on their livelihoods, lands, etc.? Will the IP be direct beneficiaries/ stakeholders in the project/programme?	YES		OS 4: Indigenous People OS 6: Cultural Heritage OS 10: Community Health, Safety and Security *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 4, OS 6, and OS 10* *- ESSPP Annex A: Practical Guide for OS 4 – Indigenous People, which details assessment and consultation requirements that are to be considered.* *- ESSPP Annex I (for related definitions)*	The ESIA will confirm on the presence of indigenous peoples (IPs) in the project areas. The ESIA will also assess any potential impacts on indigenous peoples (IPs), marginalized groups, and vulnerable groups and the ESMP will define specific mitigation actions to respect, conserve and maintain the knowledge, innovations and practices of indigenous and local communities, as well as to protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements. The above activities will be carried out through a Free, Prior and Informed Consent (FPIC) process to: (a) ensure a positive engagement of IPs, marginalized groups, and vulnerable groups in the project activities; (b) avoid adverse impacts, or when avoidance is not possible, minimize, or compensate for such effects; (c) tailor benefits in a culturally appropriate way. Based on the outcomes of the FPIC consultative process, the project team will consider whether there is a need to develop an Indigenous Peoples Plan (IPP), in accordance with UNIDO ESSPP.
6. Could the project potentially apply or promote the use of pesticides?		NO	OS 5: Pest Management *For further details please refer to:* *- The relevant section in Annex 1*	

TABLE 4 - Identification of E&S Risks (OS-specific questions)				
Project/Programme-Specific Questions	**Yes**	**No**	**Relevant Safeguards to be Triggered & Additional guidance**	**If answered "yes", detail the specific project activities and potential E&S impacts that pertain to this OS[10]**
			- ESSPP OS 5 *- ESSPP Annex I (for related definitions)* *Note: If a project manufactures, trades, and/or uses pesticides and/or chemicals subject to international action* ***bans or phase-outs****, it will be categorized as NO PROJECT.*	
7. Could any cultural heritage and/or sites be present in the project area or area of influence? Would the project directly deal with such resources?		NO	OS 6: Cultural Heritage *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 6* *- ESSPP Annex I (for definitions of cultural heritage)*	
8. Will the project involve building of new or rehabilitating of existing dams?		NO	OS 7: Safety of Dams OS 8: Labour and Working Conditions OS 9: Resource Efficiency and Pollution Prevention	

TABLE 4 - Identification of E&S Risks (OS-specific questions)				
Project/Programme-Specific Questions	**Yes**	**No**	**Relevant Safeguards to be Triggered & Additional guidance**	**If answered "yes", detail the specific project activities and potential E&S impacts that pertain to this OS[10]**
			OS 10: Community Health, Safety and Security *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 7, OS 8, OS 9, OS 10* *- ESSPP Annex B: Practical Guide for OS 7 – Safety of Dams* *- ESSPP Annex I (for related definitions)* *In the case of SHP projects, please explicitly state that run-of-the-systems will be used, if applicable.*	
9. Could the working environment pose a potential threat to technical staff (e.g. gas leakage, PCB oil spillage, exposure to chemicals and/or other hazardous materials, electric shocks, use of potentially hazardous tools, machinery and equipment, exposure to heights, etc.)?	YES		OS 8: Labour and Working Conditions *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 8*	During the value-addition and processing of sea products, equipment may be installed and operated. In this regard, standard operational health and safety (OHS) procedures will be introduced and followed. The specific potential risks and related mitigation measures will be assessed as part of the ESIA and ESMP.
10. Could the project directly and/or through a third party: (i) generate or cause generation of solid, liquid or gaseous waste/emissions; (ii) use, cause use of, or manage the use, storage or	YES		OS 8: Labour and Working Conditions	The project may cause generation of waste (waste membranes for desalination – reverse osmosis) as well as discharge of brine into the ocean, this will be further analysed during the ESIA.

TABLE 4 - Identification of E&S Risks (OS-specific questions)				
Project/Programme-Specific Questions	**Yes**	**No**	**Relevant Safeguards to be Triggered & Additional guidance**	**If answered "yes", detail the specific project activities and potential E&S impacts that pertain to this OS[10]**
disposal of hazardous materials and chemicals, including pesticides; (iii) significantly consume or cause consumption of water (> 5,000 m3/day), energy, or other resources?			OS 9: Resource Efficiency and Pollution Prevention *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 8 and OS 9*	Specific measures will be proposed in the ESMP to mitigate the impact on the environment of waste produced by project activities.
11.Could the project pose risks and have potential negative impacts to the health, safety and security (e.g., potential risks associated with project-related civil works, potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, and communicable diseases) of the project-affected communities during its lifetime?	YES		OS 10: Community Health, Safety and Security *For further details please refer to:* *- The relevant section in Annex 1* *- ESSPP OS 10*	Potential risks from project activities on the community health, safety and security from the perspective of COVID-19 pandemic will be duly considered as part of the ESIA and ESMP. All necessary prevention and mitigation measures will be undertaken to minimize the risks, including, amongst others, the use of personal protective equipment, physical distancing, personal hygiene, cleaning and disinfection, ventilation and other administrative and engineering controls, and will be updated on an ongoing basis following the national guidelines and recommendations.

Annex 1: UNIDO ESSPP – Key guidance

Environmental and social sustainability is fundamental to the achievement of development outcomes and is systematically mainstreamed into UNIDO's project cycle through consistent application of an environmental and social screening and assessment procedure. Opportunities to strengthen the environmental and social sustainability of projects need to be identified and realized. A precautionary approach shall be applied, and potential adverse impacts and risks need to be avoided or minimized if possible and mitigated if not.

UNIDO's Integrated Safeguards Policy Statement (ISPS) sets out the Organization's commitments to and responsibilities for ensuring environmental and social sustainability, and its pledge to reducing the risk of non-compliance with UNIDO's environmental and social safeguards. UNIDO is committed to ensuring that its projects comply with the Organization's safeguards by assessing environmental, climate change and social risks and impacts as early as possible in the project cycle, disclosing relevant information and providing effective monitoring and supervision of agreed environmental and social management and mitigation measures during project implementation. If the Organization finds that the environmental or social impacts of any of its proposed projects are not likely to be adequately addressed, it may choose not to proceed with the project.

UNIDO assists its Member States with technical assistance type projects, which largely provide capacity building, training and awareness raising, strategic planning, policy reform, institution strengthening, technology conversion and rehabilitation services. Investment projects supported by UNIDO are predominantly demonstration-scale interventions, such as pilot demonstrations of specific technologies. On occasion, UNIDO also engages in the (co-) development of inclusive and sustainable industrial parks. Within the context of its technical assistance projects and operations, UNIDO is committed to full compliance with the following safeguard standards:

OS 1: Environmental and Social Assessment

OS 1 is an overarching safeguard providing the framework for the required environmental and social screening and assessment that all UNIDO projects should undergo. This OS also determines whether proposed projects could potentially involve activities or components that pose any specific risks covered by OS 2 to OS 10 and whether any of these Operational Safeguards need to be triggered.

OS 2: Protection of Natural Habitats and Biodiversity

This OS recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. Depending on the nature and scope of proposed activities, UNIDO may engage in projects targeting or located in ***critical habitats***[11], so long as these projects do not infringe on the protection of the critical habitats**.** Moreover, UNIDO does not engage in any projects that introduce or use potentially invasive, non-indigenous alien species. UNIDO uses a precautionary and ecosystem-centred approach to natural resource conservation and management to ensure opportunities for environmentally sustainable development. The safeguard reflects the importance of biodiversity and the value of key ecosystems to the population, emphasizing the need to respect, conserve and maintain the knowledge, innovations and practices of indigenous

[11] For a definition of the term 'critical habitat' and the other terms used in Annex 1, please refer to ESSPP Annex I.

and local communities, and to protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.

OS 3: Involuntary Resettlement and Land Acquisition

The objective of this OS is to avoid physical and economic displacement as a result of project-related land use. This safeguard ensures that projects potentially involving land acquisition resulting in involuntary physical and/or economic displacement are either re-designed to include viable alternatives or are not approved for further development by UNIDO.

OS 4: Indigenous People

UNIDO ensures that, consistent with the rights and responsibilities set forth in the United Nations Declaration on the Rights of Indigenous Peoples and other international instruments relating to indigenous peoples,[12] projects are designed and implemented in a way that fosters full respect for indigenous peoples, including those living in voluntary isolation, and for their dignity, human rights, and cultural uniqueness so that they (a) receive culturally appropriate social and economic benefits; and (b) do not suffer adverse effects during the development process.[13]

OS 5: Pest Management

UNIDO ensures that, in any project applying or promoting the use of pesticides, the environmental and health risks associated with pesticide use are minimized and managed, and that safe, effective, and environmentally sound pest management is promoted and supported. The principles of integrated pest management[14] and integrated management of vectors and intermediate hosts[15] are applied, to the extent feasible. UNIDO does not support the use of any pesticides, products or chemicals specified under the Stockholm Convention on Persistent Organic Pollutants or classified by the World Health Organization (WHO) as Classes IA, IB, or II. Additionally, UNIDO ensures that its projects follow the minimum standards described in the *Code of Conduct on the Distribution and Use of Pesticides* of the Food and Agriculture Organization of the United Nations (FAO).

OS 6: Cultural Heritage

UNIDO recognizes the vital importance of cultural heritage[16] for current and future generations. This OS is designed to ensure that effective and active measures are taken to avoid support for projects involving the alteration of, damage to or removal of any type of tangible or intangible cultural heritage. Should such

[12] Including the International Labour Organization Convention 169 on Indigenous and Tribal Peoples (1989); United Nations Declaration on the Rights of Indigenous Peoples (2007); UNDG Guidelines on Indigenous Peoples' Issues (2008); United Nations Permanent Forum on Indigenous Issues (under the Economic and Social Affairs Department), Inter-Agency Support Group on Indigenous Issues, and United Nations International Decade of the World's Indigenous Peoples Plan of Action.

[13] For definitions of 'indigenous peoples' and 'indigenous peoples living in voluntary isolation', please refer to Annex I. For further details, please see: http://www.oas.org/en/iachr/indigenous/docs/pdf/Report-Indigenous-Peoples-Voluntary-Isolation.pdf.

[14] For a definition of 'integrated pest management', please refer to ESSPP Annex I.

[15] For a definition of 'integrated management of vectors and intermediate hosts', please refer to ESSPP Annex I.

[16] For a definition of 'cultural heritage', please refer to ESSPP Annex I.

potential adverse impacts on a type of cultural heritage be identified during the development period, UNIDO management will decide, in consultation with national counterparts, either to relocate the project to a different site or to stop any further project development.

OS 7: Safety of Dams

The objective of this OS is to ensure quality and safety in the design, construction, operation, and maintenance of new dams and in the rehabilitation of existing dams. UNIDO does not usually engage in large-scale water management infrastructure investment projects that involve the construction or rehabilitation of large and complex dams, i.e. dams of height above 15 meters.

OS 8: Labour and Working Conditions

The objective of this OS is to ensure that UNIDO supported projects comply with national labour laws, and with the objectives of the International Labour Standards of the International Labour Organization (ILO), which include: (i) to promote fair treatment, non-discrimination, and equal opportunity for workers; (ii) to promote compliance with national employment and labour laws, which comply with the mentioned standards; (iii) to protect workers, including vulnerable categories of workers such as children, women, and migrant workers; (iv) to promote safe and healthy working conditions and the health of workers; and to avoid the use of forced labour, trafficked labour or child labour.

OS 9: Resource Efficiency and Pollution Prevention

While UNIDO's ESSPP is governed by a precautionary approach and most UNIDO projects aim to foster resource efficiency and/or pollution prevention, this OS ensures the adoption of a project-level approach to resource efficiency, cleaner production processes and pollution management, in line with internationally disseminated technologies and practices.[17] The objective of this OS is, therefore, to avoid or minimize the adverse impacts of pollution on human health and the environment by avoiding or minimizing project-level wastes, emissions, and pollution. Additionally, the OS strives to promote a more sustainable use of resources, including materials, energy, land and water.

OS 10: Community Health, Safety and Security

This OS recognizes that project activities, equipment, and infrastructure can increase the exposure of project-affected communities and beneficiaries to health, safety and security risks and impacts, and ensures that these health, safety, and security risks and impacts are avoided or minimized and that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles. The objective of this OS, therefore, is to anticipate and avoid adverse impacts on the health, safety and security of project-affected communities and beneficiaries during the project lifetimefrom both routine and non-routine circumstances.

[17] As reflected in internationally recognized standards such as the World Bank Group's *Environmental, Health, and Safety Guidelines*, available at http://www.ifc.org/ehsguidelines. These standards contain performance levels and measures that will normally be acceptable and applicable to projects. When national regulations differ from these levels and measures, the project will achieve whichever are more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the project will provide full and detailed justification for any proposed alternatives, provided that such alternatives are consistent with the ESSPP.

OS 11: Information Disclosure and OS 12: Accountability and Grievance System

Framework Operational Safeguards, OS 11 and OS 12, provide overarching frameworks on UNIDO's information disclosure requirements and the accountability and grievance system. As such, they are not directly relevant for completing E&S Screening. However, OS 11 and OS 10 are applicable to all UNIDO projects, even those with minimal or no adverse environmental or social impacts. The requirements of these operational safeguards also apply to UNIDO project executing entities.

ESS Categorization Guidance

Project[18] categorization is based on a combination of project type, characteristics of potential impacts, and sensitivity of the receiving environment, i.e. planned project site. In the meantime, the following provides an indication of how UNIDO projects might be categorized and a framework for the screening decision. However, many factors come into play during screening, and the below should not be used as the sole basis for decision-making. Project concept screening results in the determination of one or more of the following categories:

Category A: A proposed project is classified as Category A if it is likely to induce significant and/or irreversible adverse environmental and/or social impacts that are sensitive, diverse, or unprecedented, or that affect an area broader than the sites or facilities subject to physical works.

Projects that would usually be identified as Category A are large-scale infrastructure development investment projects supported by multilateral and regional development banks. The projects or components included in this list could potentially have adverse impacts and normally warrant the subsequent conducting of an Environmental and Social Impact Assessment (ESIA) and an agreement on a proper Environmental and Social Management Plan (ESMP):

- Projects involving resettlement of populations;
- Projects with construction of new dams of height above 15 meters;
- Projects on large-scale aquaculture and mariculture;
- Projects on large-scale energy production and distribution facilities;
- Resource recovery facilities projects (e.g. large-scale mining operations, large-scale recycling plants);
- Large-scale agro-industry projects;

[18] When reference is made to 'project', this also encompasses 'programme'.

- Large-scale afforestation/reforestation, including logging operations, use of Mangroves and wetlands projects;
- Large-scale forest industry operations projects, such as sawmills and pulp and paper mills;
- Projects that establish new and/or relocate industrial zones and/or industrial parks;
- Projects that establish new and/or relocate large-scale manufacturing, processing and/or treatment plants (e.g. wastewater, POPs, etc.);
- Projects that may have potentially significant adverse impacts on physical cultural resources;
- Large-scale natural resource extraction activities such as farming, irrigation, mining or fishing; and
- Activities that require an ESIA by national law are also classified as A.

Category B: Category B projects often differ from Category A projects only in scale. They are likely to have less adverse impacts on human populations or environmentally important areas than those of Category A projects. Likely impacts will be few in number, site-specific, and few if any will be irreversible. In most cases impacts can be readily minimized by applying appropriate management and mitigation measures or incorporating internationally recognized design criteria and standards.

The following projects and components may have environmental and/or social impacts that would result in less serious risks, and warrant the development of ESMPs instead of ESIAs:

- Energy efficiency and energy conservation projects;
- Projects with rehabilitation of dams of height above 15 meters;
- Small- and medium-scale agro-industries projects;
- Small- and medium-scale irrigation and drainage projects;
- Projects on small and medium-scale aquaculture, including small and medium-scale industrial and artisanal fisheries;
- Renewable energy projects (incl. new hydroelectric dams 15 metres or below in height);
- Rural electrification projects, including mini-grids;
- Limited bioenergy projects;
- Climate adaptation projects;

- Chemicals and waste recovery, recycling and destruction projects (e.g. projects dealing with phase-out and handling of persistent organic pollutants, ozone depleting substances, e-waste, mercury and other heavy metals, etc.) at existing facilities;
- Small- and medium-scale reforestation/afforestation projects;
- Small- and medium-scale rural water supply and sanitation projects; and
- Projects that may have potentially minor adverse impacts on physical and cultural resources.

Category C: A proposed project is classified as Category C either if it is likely to have minimal or no adverse social and/or environmental impacts (e.g. studies, mapping, strategy development, business plan development, feasibility study development, policy advice, inventory work, and awareness raising / capacity building activities) and/or has only a minor budget allocation.[19] Moreover, projects that centre on the setting-up of financial mechanisms, accelerators/incubators, business models and the like are classified as Category C.[20] All Category C projects that develop full feasibility studies for Category A projects will need to include an ESIA within the feasibility study, unless an ESIA, meeting the standards of ESSPP, has been or will be undertaken by another project stakeholder.

No further specific environmental and/or social assessment is required for a Category C project beyond the ESS screening. It is, however, important to note that Category C projects, particularly those with procurement components, may still have potential environmental and social sustainability considerations. These should be addressed as part of the regular project design activities and through UNIDO's procurement processes, as applicable.

Category "NO PROJECT": (i) is likely to infringe on the protection of a critical habitat;[21]; (ii) introduces or uses potentially invasive, non-indigenous alien species; (iii) uses banned pesticides and/or chemicals, (iv) causes involuntary resettlement or physical and economic displacement; (v) is likely to alter, damage, or remove any cultural heritage and/or sites; or (vi) uses forced, trafficked, or child labor. Projects categorized as NO PROJECT cannot be supported by UNIDO, since they are not in compliance with UNIDO's Standards. Further discussions with stakeholders are required to re-design and/or relocate the project in order to re-categorize the project. Failing this, the proposal will not be considered for further development.

[19] Please note that projects shall neither be divided into two or more separate projects nor deliberately under-budgeted for the purpose of meeting this criterion.
[20] However, the design of selection criteria for such mechanisms/schemes/models should include ESS considerations, in line with the requirements set out in the ESSPP, while the selected financial intermediaries are exected to have their own environmental and social management systems in place in order to address any identified ESS risks. This ensures that resulting proposal, investment, and project submissions towards the said mechanisms/schemes/models undergo separate environmental and social screenings and assessments..
[21] For exact definition please refer to ESSPP Annex I.