Meeting of the Board
6 – 8 July 2019
Songdo, Incheon, Republic of Korea
Provisional agenda item 20

GCF/B.23/02/Add.06

14 June 2019

Consideration of funding proposals - Addendum VI

Funding proposal package for FP112

Summary

This addendum contains the following seven parts:

a) A funding proposal titled "Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands";
b) No-objection letter issued by the national designated authority(ies) or focal point(s);
c) Environmental and social report(s) disclosure;
d) Secretariat's assessment;
e) Independent Technical Advisory Panel's assessment;
f) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
g) Gender documentation.

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Funding Proposal

Version 1.1

The Green Climate Fund (GCF) is seeking high-quality funding proposals.

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Project/Programme Title:	Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands
Country/Region:	Republic of Marshall Islands
Accredited Entity:	UNDP
Date of Submission:	23 April 2019

Contents

Note to accredited entities on the use of the funding proposal template

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:
"[FP]-[Agency Short Name]-[Date]-[Serial Number]"

A.1. Brief Project / Programme Information			
A.1.1. Project / programme title		**Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands**	
A.1.2. Project or programme		Project	
A.1.3. Country (ies) / region		**Republic of Marshall Islands**	
A.1.4. National designated authority (ies)		**Office of Environmental Planning and Policy Coordination**	
A.1.5. Accredited entity		**United Nations Development Programme**	
A.1.5.a. Access modality		☐ Direct ☒ International	

A.1.6. Executing entity / beneficiary		Executing Entity:
		United Nations Development Programme
		Beneficiary:
		• Outer atoll and island communities (approx. 15,572 direct beneficiaries, including 7,630 women)
		• Population of RMI (55,226) will benefit indirectly through capacity building and integration of water management into national governance framework.
		• National and local government:
		  ○ Office of Chief Secretary
		  ○ Environment Protection Agency
		  ○ National Disaster Management Office
		  ○ Office of Environmental Planning and Policy Coordination
		  ○ Local governments (24 in total)
		• NGOs/CBOs (WUTMI and others)	

A.1.7. Project size category (Total investment, million USD)		☐ Micro (≤10) ☐ Medium (50<x≤250)	☒ Small (10<x≤50) ☐ Large (>250)
A.1.8. Mitigation / adaptation focus		☐ Mitigation ☒ Adaptation ☐ Cross-cutting	
A.1.9. Date of submission		22 Jun 2018 / 12 April 2019/ 23 April 2019	
A.1.10. Project contact details	Contact person, position	Jose Padilla	
	Organization	UNDP	
	Email address	Jose.padilla@undp.org	
	Telephone number	+66 2 304 9100 ext 2730	
	Mailing address	3rd Floor UN Service Building, Rajdamnern Nok Ave, Phranakorn, Bangkok 10200, Thailand	

A.1.11. Results areas *(mark all that apply)*

Reduced emissions from:

☐ Energy access and power generation
(E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)

☐ Low emission transport
(E.g. high-speed rail, rapid bus system, etc.)

☐ Buildings, cities and industries and appliances
(E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)

☐ Forestry and land use
(E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

Increased resilience of:

☒ Most vulnerable people and communities
(E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)

☒ Health and well-being, and food and water security
(E.g. climate-resilient crops, efficient irrigation systems, etc.)

☐ Infrastructure and built environment
(E.g. sea walls, resilient road networks, etc.)

☐ Ecosystem and ecosystem services
(E.g. ecosystem conservation and management, ecotourism, etc.)

A.2. Project / Programme Executive Summary (max 300 words)

1. The project supports the Government of Republic of the Marshall Islands (GoRMI) in adapting to increasing climate risks, particularly more frequent and extreme droughts, which impact the country's drinking water supply. Communities and the households in RMI primarily rely on a single water resource and supply system, which makes them highly vulnerable to risks of water shortages and drought. Despite previous water related investments, the people of RMI still do not have year-round access to safe freshwater supply for drinking, cooking hygiene and sanitation, particularly under droughts lengthened through climate change impacts.
2. The proposed intervention aims to increase resilience of water resources for drinking and hygiene purposes in RMI. This will be done by:
   - Improving household and community rainwater harvesting and storage structures to increase resilience of water supply in all outer islands and atolls accounting for approximately 28% of RMI's population, including 7,630 (49%) women, currently at risk
   - Securing groundwater resources from contamination due to inundation caused by wave overtopping of seawater.
   - Strengthening the technical capacities of national and subnational institutions and key stakeholders to integrated climate change risks into water governance processes so that management of climate change risks are coordinated, effective, participatory, equitable, and sustained over the long-term when risks are expected to worsen.
3. The project aligns with GoRMI's key climate change policies and strategies and has been developed through extensive consultation with government, Non-Government Organisations (NGOs), Community-Based Organisations (CBOs) and beneficiary communities. The proposed project is aligned with RMI's NDC and country work programme to the GCF. The NDA has issued a letter of no-objection and the proposed project is aligned with the work programme of the AE (UNDP) selected by the NDA.

A.3. Project/Programme Milestone

Expected approval from accredited entity's Board (if applicable)	12 Jun 2019
Expected financial close (if applicable)	TBD (Date of agreement on the FAA between UNDP and GCF)
Estimated implementation start and end date	Start: 15/11/2019 End: 14/11/2026
Project/programme lifespan	7 years project delivery; outcome lifespan - 25 years

B.1. Description of Financial Elements of the Project / Programme

4. The Government of the Republic of Marshall Islands requests grant financing for this project. This particular GCF financing instrument is requested due to the nature of the investment proposed by the project. GCF funds are sought to cover the additional cost of ensuring the necessary additional water supply capacity is in place given the additional days of drought expected as a result of climate change.

5. RMI, as with many small island developing states, had little if anything to do with causing climate change, but is left to now cope with the consequences of global climate change. Reflecting upon the fact that the RMI government does not have the resources to cover the additional investment required due to climate change given the economic and financial limitations of the country (i.e. low scope for private sector development, ending of the US compact grant funding in 2023), resources from the GCF is sought. Considering the geographic and population dispersion, traditional public water supply systems are unviable in the outer islands and atolls. This makes the reliance on a revenue generating water supply system, which perhaps could have entailed the use of non-grant financing, also not possible.

6. Rainwater harvesting at the household and community levels constitute the most cost effective and viable options for water supply, complemented by limited desalination (in extreme situations) which is far more expensive. Therefore, in the context of RMI, the traditional public-sector responsibility is transferred to private households. Both capital expenditures (capex) and operational expenditures (opex) for water supply fall on the households and communities of the outer islands and atolls.

7. The additional investment required to ensure the necessary water resources taking into account climate change impacts is USD **18,631,216**. This is the amount requested from GCF in the form of grant financing. The project also leverages co-financing of USD 6,116,092 (cash) provided by the GoRMI to meet baseline water requirements.

Table 1: Financial Elements per project outputs

Output	Activity	GCF funding amount (USD)	Co-financing funding amount (USD)	Amount (for entire project) (USD)
Output 1: Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI	Activity 1.1. Improve existing rainwater harvesting systems for community buildings and households in outer islands and atolls for usage during increasing frequency and periods of drought	3,691,950	2,667,564	6,359,514
	Activity 1.2. Provide additional rainwater harvesting systems and increase of storage capacity for communities in outer islands and atolls for usage during increasing frequency and periods of drought	7,523,785	2,893,919	10,417,704
Output 1 Sub Total		**11,215,735**	**5,561,483**	**16,777,218**
Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall	Activity 2.1. Protect groundwater wells from more frequent climate change induced storm surges and contaminations	1,227,247	0	1,227,247
	Activity 2.2. Enhance women and youth's leadership through best practices and community awareness	1,468,881	0	1,468,881

	programmes on efficient usage (demand management) of rainwater			
Output 2 Sub Total		**2,696,128**	**0**	**2,696,128**
Output 3: **Climate change induced drought preparedness and response measures implemented in outer atolls and islands[1]**	Activity 3.1. Update national-level contingency plans and Standard Operating Procedures (SOPs) for climate change induced drought response	1,502,330	0	1,502,330
	Activity 3.2. Develop and implement community-level drought contingency planning in outer islands and atolls	2,481,996	0	2,481,996
Output 3 Sub Total		**3,984,326**	**0**	**3,984,326**
Project Management Cost		**735,027**	**554,609**	**1,289,636**
Total Project Financing		**18,631,216**	**6,116,092**	**24,747,308**

8. A breakdown of cost/budget by expenditure type (project staff and consultants, travel, goods, works, services, etc.) and disbursement schedule in project confirmation (term sheet) is included in Annex V.
9. Post project implementation (i.e. year-8 onwards) the GoRMI has also committed to cover costs of USD 13,972,060 in the form of grant and in-kind for a period of 18 years covering the useful life the water assets developed by the project (i.e. 25-year project lifespan including the 7-year project period). During this period the following expenditure will be utilized towards O&M including costs for i) general maintenance of water assets; ii) Sustenance capex; and iii) Full replacement of specific water assets and components that have a shorter life than the total project lifecycle period of 25 years. The table below summarizes the financing structure for the 25-year project lifespan.

25-year Project Budget	0 - 7 years		8 - 25 Years		Total	
	GCF	GRMI	GCF	GRMI	GCF	RMI
Capital Costs	18,173,560	5,844,047	-	7,084,315	18,173,560	12,928,362
Sustenance CAPEX	-	-	-	1,562,701	-	1,562,701
O&M Costs	457,656	272,045	-	5,325,044	457,656	5,597,090
Total	**18,631,216**	**6,116,092**	**0**	**13,972,060**	**18,631,216**	**20,088,153**

B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
(a) Total project financing	**(a) = (b) + (c)**	$24.747	million USD ($)		

[1] Existing activities being undertaken by the Government of RMI meet baseline disaster preparedness, so no co-funding is included in Output 3.

(b) GCF financing to recipient	(i) Senior Loans (ii) Subordinated Loans (iii) Equity (iv) Guarantees (v) Reimbursable grants * (vi) Grants *	.... $18.631	Options Options Options Options Options million USD ($)	( ) years ( ) years	( ) % ( ) % ( ) % IRR
	** Please provide economic and financial justification in section F.1 for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project/programme's expected performance against the investment criteria indicated in section E.*				
	Total requested (i+ii+iii+iv+v+vi)	$18.631	million USD ($)		

(c) Co-financing to recipient	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
	Grant	6.116	million USD ($)	RMI Government			Options
	Lead financing institution: N/A						
	** Please provide a confirmation letter or a letter of commitment in section I issued by the co-financing institution.*						
(d) Financial terms between GCF and AE (if applicable)	*N/A*						

B.3. Financial Markets Overview (if applicable)

10. Not applicable

C.1. Strategic Context

Geographic location/context

11. The Republic of the Marshall Islands (RMI) is a small island developing state (SIDS) consisting of 29 coral atolls and 5 single islands (refer Annex IX for map). The nation is a large-ocean state, with a total land area of only 182 km^2, spread across over 2 million km^2 of ocean. There are 24 inhabited atolls and islands, which are mostly remote and lie merely 2 m above sea level on average. There are no rivers, streams or lakes in RMI and the number of small surface ponds is very limited.

12. The RMI is particularly vulnerable to climate change. With its climate influenced by large ocean-atmosphere interactions such as trade winds, El Niño, monsoons and tropical cyclones, and with populations and infrastructure concentrated in small low-lying islands and atolls largest of which is only 16 km^2, any rise in sea-level, changes in weather patterns or extreme events have significant and profound effects on settlements, living conditions and the economy.

13. The hydro-geophysical features of the country significantly contribute to its high vulnerabilities to natural disasters and climate change. Although not RMI is not located within the core cyclone belt (refer Annex IIa), its geographic location is such that it is heavily influenced by storms, king tides, sea level rise, El Nino, reduced annual rainfall and temperature rise contributing to reduction of water security for the residents of RMI.

14. Droughts and storm waves are the main extreme events that impact RMI. Historical data show a decreasing trend of rainfall quantities, with drought risk respectively increasing. Periods of drought are a common occurrence after an El Niño-Southern Oscillation (ENSO). The atolls and islands located 10°N and further north receive less than 1,250 mm (50 inches), while the atolls and islands located further south of 7°N receive more than 2,500 mm (100 inches) of rain annually.

15. Increasing sea level rise and decreasing rainfall characterize[2] RMI's vulnerability to climate change in relation to freshwater supply (refer discussion on 'Observed Climate Changes' and 'Climate Projections' below). These climate change impacts are likely to exacerbate the risks of freshwater shortages in RMI, challenging the ability of the Marshallese people to have access to safe freshwater resources year-round.

Populations/socioeconomics

16. As of 2017, RMI has an estimated population of over 55,000 spread across 24 of the 29 atolls. Nearly 75% of this population lives in the two urban centers of Majuro (approximately 27,000) and Ebeye (approximately 11,000). RMI is a high human development and a lower middle-income country with a 2016 per capita income of USD 3,665, yet the country fails in indicators such as under-5 mortality and infant mortality rates compared to other countries of similar income.[3] Approximately 20% of population of RMI has been reported to be living on less than USD 1 a day.[4]

17. Given its small and sparsely distributed land and population size, RMI's economy is small and fragile. Since its independence in 1990, RMI's revenues depend heavily on resources provided by the United States under the Compact of Free Association (Compact), the current Compact is scheduled to expire in 2023[5]. The remaining income of the country is derived from the service sector accounting for nearly 70% of the GDP, royalties from the fisheries sector and small-scale handicrafts and mostly subsistence agriculture. Industry is limited to the processing of coconut products and tuna.

18. Due to the limited land and significant distances between islands and atolls, the cost of economic activity is high and economies of scale are hard to achieve. Similarly, the cost of providing of government services are high and constrained by logistical challenges. Responding to the impact of drought is logistically complex and expensive. The estimated cost of responding to the severe drought in 2015-2016 was reported to be approximately USD 1.3 million with total post-disaster recovery estimated at USD 3 million[6] – nearly 4.5% of the country's GDP of USD 115 million. The United States Government is reported to have provided USD 5.5 million for drought relief to the Marshall Islands during the previous significant drought in 2013[7]. With climate change projections for RMI indicating that droughts are to become longer,

[2] Historic data shows a decreasing trend of rainfall quantities, with drought risk respectively increasing. Historic observation data indicate that the sea level has risen near Majuro by about 7mm (0.3 inches) per year since 1993. This is larger than the global average of 2.8–3.6 mm (0.11– 0.14 inches) per year. In the future, sea level is projected to continue to rise.
[3] Source. The World Bank, 2016
[4] Government of RMI. 2007. Republic of the Marshall Islands National Action Plan for Disaster Risk Management
[5] The RMI will continue to receive annually declining grants averaging US$45 million (26 precent of GDP as of FY2012) until FY2023. 1 A Compact Trust Fund (CTF) is being built up to provide funding from FY2024 onwards. The fiscal year runs from October to September. Source: IMF 2014. IMF Country Report No. 14/26. RMI. Staff Report for the 2013 Article IV Consultation.
[6] RMI 2017 PDNA
[7] Personal communication with USAID funded Climate Ready Program

more severe and more frequent, without a long-term solution, RMI will continue to spend scarce public financing on disaster response.

19. Given this context, a cost-effective and practical investment will be required to promote increased capacity for water harvesting and storage, along with promotion of efficient use of water in RMI during times of severe drought. Investing in a long-term adaptation response to the expectation of increased incidence of drought now will result in significant savings in the future and support climate resilient socio-economic development of the RMI.

Observed climate changes

20. The atolls and islands located 10°N and further north receive less than 1,250 mm (approximately 50 inches), while the atolls and islands located further south of 7°N receive more than 2,500 mm (approximately 100 inches) of rain annually.

21. The rainfall data for Majuro from 1965-2016 reveals periods of very low rainfall and drought in 1965, 1970, 1977, 1983, 1992,1998, 2001, 2007/08, 2012/13 and 2015/16 (Figure C1.1). These dry periods on Majuro for the most part reflect broad drought events that encompassed the entire region, and correlate with the El Niño events. Droughts generally occur in the first four to six months of the year following an El Niño. Following severe El Niño events, rainfall can be reduced by as much as 80% (Polhemus (2017). The dry season begins earlier and ends much later than normal.

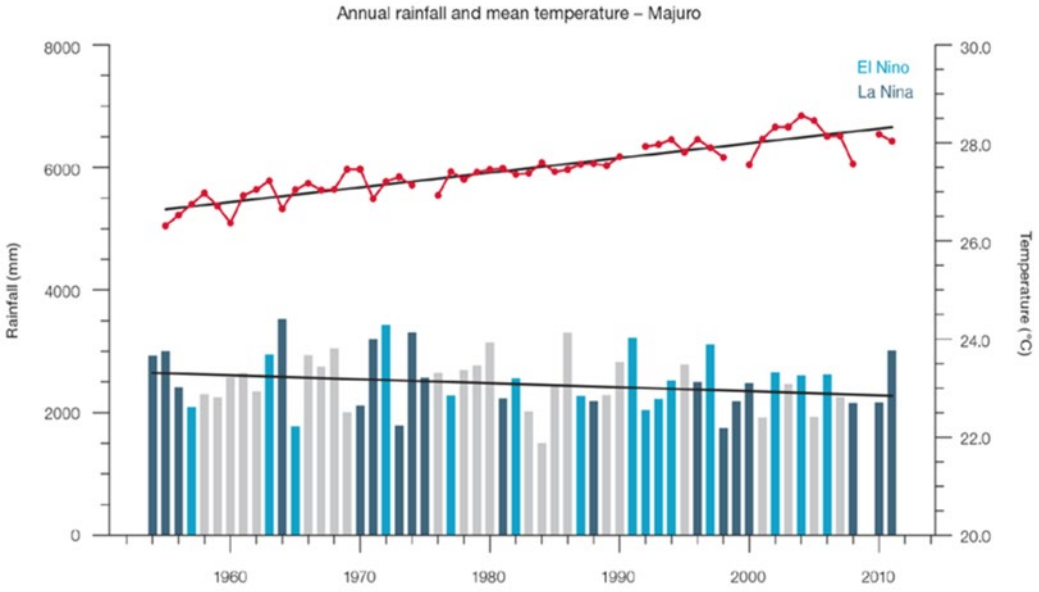


Figure C1.1 historic annual average rainfall and mean temperature for Majuro

22. Polhemus (2017) observes that severe droughts are occurring more frequently than previously estimated by researchers. He indicates that during the droughts of 1982/83, 1992 and 1995, rainfall at both Kwajalein and Majuro for the period from January through May was only 13% of the long-term averages for each location. In addition, during the 2015/16 drought total rainfall at Majuro from October 2015 to July 2016 was the driest 10-month period in the 62-year historical record at that station. He postulates "that the recurrence interval of severe meteorological drought at Majuro seems to be closer to 10-15 years, in close track with ENSO cycles"[8].

23. Based on data from two rainfall recording stations operational since 1945 and 1955, the rainfall in RMI overall has steadily declined over the last 45-years. The 2013 National Climate Assessment, notes a trend of less rainfall in the Marshall Islands over the same period of 7.5mm and 10mm less of monthly rainfall per decade for these two stations. This trend is supported by data from newer stations with shorter periods of record showing that rainfall decreases across the RMI as one moves from south to north, and from east to west, with the northwestern atolls being the driest.

[8] Dan A. Polhemus (2017), Drought in the U. S. – Affiliated Pacific Islands: A Multi-Level Assessment. Pacific Islands Fish & Wildlife Office U. S. Fish & Wildlife Service

There has also been a decrease in the number of very wet days since 1953. The remaining annual, seasonal and extreme rainfall trends at Majuro and Kwajalein show little change.

24. Based on this rainfall data the national maximum and median number of days with little or no rain are 132 days and 11 days, respectively. During the 2015/2016 drought which had the lowest recorded average dry season rainfall, more than 52 rural communities across 13 local government jurisdictions were estimated to have experienced more than 100 days of drought days with acute water shortages. However, considering the geographical expanse of the country, the stressors across the islands vary greatly. For example, during this same drought, the numbers of days communities experienced acute water shortage ranged from 175 days in the Ujae atoll to 0 in the Kili atoll.
25. Warming trends are also evident in both annual and half-year mean air temperatures based on the data from Majuro and Kwajalein stations, with mean temperatures showing a statistically significant upward trend. Warming trends are also evident in extreme daily temperatures with the number of warm days increasing and cool nights decreasing at both stations. These warming trends can correlate to higher evaporation from surface water storage structures.
26. Historic observation data indicate that the sea level has risen near Majuro by about 7mm (0.3 inch) per year since 1993. This is larger than the global average of 2.8–3.6 mm (0.11– 0.14 inch) per year. Furthermore, king tides (very high spring tides that typically occur between November to March – not the result of storm surge) are a common phenomenon in RMI and the consistent inundation from tides and tidal/storm surge flooding compromises groundwater as a potential drinking and cooking water source.

Climate projections

27. The climate modeling exercise conducted specifically for this project (see Annex II Feasibility Study – Annex 22) uses data from seven existing weather stations. These sites were used for hydroclimate projection analysis (rainfall, drought and aridity) and extrapolated for seven corresponding climate regions considering the significant geographic spread of the country. The key impact of climate change on the RMI, as modelled to 2045, is likely to be higher rainfall but with longer and more intense dry periods. Modelling conducted for the development of this proposal indicates that increases in frequency and duration of droughts are very likely across RMI.
28. Wet season (May-October), dry season (November-April) and annual average rainfall is projected to increase over the course of the 21st century. Most models simulate little change (-5% to 5%) in rainfall by 2030, however by 2090 the majority simulate an increase (>5%) in wet season, dry season and annual rainfall. In fact, approximately one third of models simulate a large increase (>15%) in rainfall under the higher (i.e. A1B medium and A2 high) emissions scenarios, for the dry season in the northern Marshall Islands and on both a seasonal and annual basis in the south.
29. Changes in drought were analyzed in terms of drought frequency (% change in frequency of 20-day droughts, 30-day droughts and 60-day droughts), the average duration of typical but impactful (e.g., roughly once in five or six years) droughts, as well as aridity (which accounts for the increasing evaporative demand of the atmosphere in a warming climate). It is well known that droughts in the RMI are driven by basin-scale interannual climate fluctuations due to the quasi-periodic El Nino-Southern Oscillation (ENSO) cycle. However, the analysis focused on changes in drought characteristics (be they frequency or duration) that are entirely due to anthropogenic climate change including its influence on ENSO and hence drought.[9]
30. The analysis confirmed that the projected changes in drought frequency are not uniform across the RMI and depend on duration of drought being considered. It was found that a minimum no-rain threshold of 30 days is a more appropriate representation of a "once in 5-years drought" for southern islands of RMI, while 60 days is a more appropriate representation of a "once in 5-years drought" for the northern islands. These typical durations were considered as part of baseline considerations for these regions against the projected anthropogenic factors of extending droughts due to climate change factors. Across RMI, these droughts (30 days in the southern islands and 60 days in the northern islands) can be referred to as 'typical but impactful droughts', which occur on average once in 6 years between the present and 2035 and once in 5 years between 2035 and 2045. The analysis further shows that increases in drought frequency (of either duration, at either time horizon) cannot be ruled out at the 95% confidence level at almost all sites. For example, only for one sight was there high confidence that drought events of 30 days in duration will not increase (at either 2035 or 2045). Furthermore, drought projections at 2035 are in general more severe than for the 2045-time horizon in drought frequency and duration.
31. For this proposed project, the salient data is the projected changes (days) in drought duration for time horizons of 2035 and 2045 for each RMI climate region. The greatest increase in drought duration within 95% confidence limits provides

[9] Changes in drought frequency were analyzed with the following two key assumptions or parameters: (1) any daily rainfall less than 3 mm was effectively zero, and (2) any period of 30 or 60 consecutive days with effectively zero rain may be considered a drought event

the basis for the interventions proposed by this project. Table C1.1 superimposes climate change-induced increases in drought days with current baseline drought days to suggest longest droughts within 95% confidence limits. This is further corroborated by observed drought durations based on existing data.

Table C1.1. Baseline vs climate change induced droughts

Climate Region	Baseline Drought Length Days (Climate Model)*	Baseline Drought Length Observed**	Projected Additional days of Drought 2025-35 or 2035-45***	Projected Drought Length up to 2045	Observed Length of 2015/16 Drought
1	60	90	20	110	134
2	60	90	30	120	143
3	60	70	30	100	100
4	60	60	58	118	128
5	30	40	17	57	120
6	30	40	27	67	93
7	30	40	19	59	91

* Analysis based on Climate Model data for years 2005 to 2015.
** Analysis of rainfall data completed by UNDP based on information provided by RMI Weather Office.
*** the higher of the projected values either in 2025 to 2035 or 2035 to 2045 periods are chosen.

32. The most significant influence on mean sea-level variability over most of the Pacific region is due to ENSO (NIWA 2016). Sea level is projected to continue to rise in RMI based on modelling of three emission scenarios (low, medium and high). Estimated increases range from 3 to 16cm (Y2030) to 22 to 62cm (Y2090). Increases in sea level, and hence increased water depths over the fringing reef flats, will also result in larger wave conditions reaching the shoreline. As both wave run-up and overwashing of the coastal berm or coastal defences by waves can be extremely sensitive to small changes in water levels and wave conditions reaching the shoreline, even very small changes in sea-level rise may have a significant impact on the frequency and volume of inundation of the immediate coastal margins.
33. Rising sea level also has the potential to exacerbate the impacts of very high tides (known as king tides), which have historically damaged infrastructure, particularly in urban centres. King tides are already having a significant impact on inundation of land areas in RMI. For the outer atolls and islands, one of the major impacts of king tides is their potential to flood unprotected wells and thereby contaminate groundwater with salt. Long-term sea-level rise will continue to push sea levels higher resulting in high tide levels increasingly exceeding what may be presently considered a king-tide level. Data from Kiribati shows that 3-4% of all high tides are presently considered a king tide, by 2030, 8-16% of all high tides would be considered king tides, by 2050, 12-29% of all high tides, and by 2090 potentially over 90% of all high tides could exceed what is presently considered a king tide. Although there is no specific similar data for RMI, given the higher than global average sea level rise in RMI, its low elevation and vulnerability to storm surge, it is reasonable to, given the higher than global average sea level rise in RMI, its low elevation and vulnerability to storm surge, it is reasonable to expect that the changes in king tides in Kiribati would be similar in RMI.

Water sources, availability and related issues

34. For the outer islands and atolls, where approximately 28% of RMI's population live, the main source of potable water is rainwater accessed from household and community rainwater harvesting systems. Whereas these systems provide adequate supply during times of sufficient rainfall, when the number of consecutive days with little or no rain exceeds a threshold, the harvesting and/or storage capacity is insufficient to meet even basic needs.
35. Water surveys conducted in 2013 in 11 atolls and islands[10] reported that 89% of households had rainwater-harvesting systems typically with one tank of either 4,542 L or 5,678 L capacity. For a household of average 6 members[11], at a water consumption level of 20 L per person per day[12], the two household rainwater tank sizes can supply water for one household for 37 (4,542L) to 47 (5,678L) days under conditions of little or no rain, if the RWH systems (gutters and downpipes) are well maintained so that the tank is full at the beginning of the dry spell. However, infrastructure surveys done as part of the project development phase found that many of the RWH systems (particularly gutters and downpipes) were in poor condition (refer to Annex II Feasibility Study).
36. Besides household rainwater harvesting systems, community RWH systems are available and utilized in the outer atolls and islands in public, commercial, or community buildings. Many of these community RWH systems are attached to

[10] Ailuk, Aur, Ebadon, Lae, Lib, Maloelap, Mejatto, Ujae, Utrik, Wotho, and Wotje. Source. 2013 Wash Survey.
[11] Average household size in outer islands and atolls calculated from 2011 Census was 6 for the outer islands and atolls, 7 for urban atolls, and 7 for the national average.
[12] WHO and SDG minimum standard to provide for drinking, cooking and basic hygiene

large roof areas but most only have one 5,678 L tank. This provides insufficient storage for rainfall capture which leads to surplus water overflowing from the tank. As discussed in the preceding sections, drought durations are projected to lengthen exacerbating the water shortages already felt by the communities in RMI.

37. Access to sanitation facilities, which are primarily water flushing toilets connected to buried septic tanks, has been increasing in the Marshall Islands. Waste from septic tanks are not collected; a new tank is installed once the current tank is full. Based from WHO and UNICEF statistics as of 2015, 77% of the population have access to improved sanitation facilities, 12% to shared facilities, 4% to other unimproved facilities. Only 7% practice open defecation (during non-drought periods). The same report noted an urban-rural divide with 84% and 56% having access to improved sanitation, respectively.
38. Sanitation infrastructure within the Outer Atolls, encompassing toilet and hand washing facilities for communities, schools and public buildings do not meet basic standards (as per UNICEF guidelines), which more apparent when considering WASH and equity of access. Flushing primarily in HH systems uses rainwater or from wells, while in schools, salt water flushing systems have been installed. During drought (2015/2016) almost all toilet facilities were compromised. Sanitation kits were provided as part of national drought response as referenced in the PDNA report from the 2015/16 DRR response.
39. It is recognized that the benefits from improved water systems are optimized when considerations for sanitation are simultaneously addressed. In the context of the Marshall Islands and this climate adaptation project an integrated approach is necessary that will encompass both the shift from the use of rainwater for flushing to groundwater (through wells) and sea water and also expanded use of waterless toilets. Interventions to address sanitation are discussed in various parts for the funding proposal and in the section on 'Selected Adaptation Solution'.
40. Due to RMI's unique geography, other options for safe freshwater resources are limited, this leads to socio-economic drought conditions where communities only have access to water from disaster response services or to relocate to either Majuro or Ebeye (which are serviced by public water systems).
41. Groundwater from the freshwater lenses underlying the atolls and islands provides a secondary source of water, however, with increasing sea-level, tidal heights and storm surges, groundwater quality is compromised, especially during droughts.
42. There are some stationary desalinated seawater reverse osmosis (RO) systems in some community centers and small mobile RO systems that are deployed by the government during extreme drought. Desalination units are costly to operate, maintain and deploy.

Challenges in responding to water shortages

43. Droughts mostly impact the availability of potable water for communities living in the Marshall Islands. Over the last 50 years, RMI has experienced ten significant droughts with the last two (in 2013 and 2016) costing the government more than USD 10 million in response and recovery costs (refer Annex II- Feasibility Study section 1.3.1). The challenge of responding to water shortages are exacerbated by the remoteness of the outer atolls and islands, the difficulty and high cost of transport between atolls, limited sources of available freshwater, weak water governance and government and community capacity deficiencies.
44. Depending upon the status of sanitation access, RMI will utilise the CWCs as conduits for promoting existing (and future) WASH initiatives as well as repeating surveys to enable the impact of the project on sanitation and health to be monitored. Improved and ongoing information collection on the status of sanitation and WASH practices throughout the outer islands will help focus both government and community actions to where they are most needed and can have the greatest impact.
45. Overall, the RMI continues to be poorly equipped to deal with drought outside of the major population centers at Majuro and Ebeye, and periodic social disruptions from drought can be expected to continue into the foreseeable future.

Overall problem that project seeks to address

46. The country faces worsening droughts, and coastal inundation (which can contaminate groundwater resources) as a result of climate change, resulting in particular water shortages that have significant economic and social impacts. In the rural areas of RMI there are no water networks or significant water storages for communities to fall back upon. These communities need to have a reliable, safe freshwater supply sufficient to see them through the projected future drought periods.
47. Furthermore, there are limited national water governance and coordination mechanisms or accountability frameworks to support water resilience. Therefore, capacity building and the development of robust governance structures at local

and national levels is required. Strengthening integrated water security is an urgent climate change adaptation priority for RMI.

National/sector policies and strategies

48. Climate change resilience and water security are key priorities for RMI, and critical to achieving various government policies and strategies for sustainable and equitable development. GoRMI has put in place national and sector policies in this respect.

49. The *RMI Water and Sanitation Policy and Proposed Action Plan*, which was formalized as a legal instrument through the *National Environmental Protection (Amendment) Act* in 2016, serves as the foundational framework for climate-resilient water sector development at the national and subnational levels. The RMI Environmental Protection Authority now has a legal mandate as the national authority for integrated water resource management.

50. Other key climate change policies and strategies include: Strategic Development Plan "Vision 2018"; National Strategic Plan (2015-2017); National Climate Change Policy Framework (2011); The Joint National Action Plan for Climate Change Adaptation and Disaster Management; and the National Gender Mainstreaming Policy and Strategic Plan of Action for 2015-2019.

51. The above strategies and policies can provide the mechanisms to help RMI to achieve climate change resilience in terms of water security, however many of them are relatively new and yet to be effectively implemented. There is a need for technical capacity building within local and national governments, along with support for the development of the processes and procedures that will enable successful application of the new policies and strategies using gender equity and social inclusion (GESI) mainstreaming approaches.

52. The project has a high-level of buy-in from the Government of RMI, reflected by a significant financial contribution to the project and an explicit long-term commitment to institutional change towards more sustainable water governance, including the formation of Community Water Committees, supported by local councils, which will provide long-term operation and maintenance structures.

C.2. Project / Programme Objective against Baseline

53. Increasing climate risks, particularly droughts which are becoming more frequent and extreme, impact RMI's drinking water supply. The proposed project will implement the most cost-effective mix of interventions to bridge the gap between current water supply capacity and the capacity needed to supply at least 20 litres per capita per day (lpcd) year round, including during drought events aggravated in frequency and duration by climate change.

54. The following sections first outline the current baseline with respect to household water availability and describe the projected demand – supply gap by 2045 under current climate and weather conditions. It is then discussed how the impacts of climate change will further widen this gap. The alternatives to close the gap and the proposed project interventions are described.

Baseline Scenario

Freshwater Resources

55. The types of freshwater resources available in the rural communities of RMI are:

- ***Rainwater*** accessed through household and community rainwater harvesting systems
- ***Groundwater*** resources are available in many of the outer atolls and islands, although information regarding their specific locations, available volume, and quality are limited. Based on survey results, groundwater is normally used for washing, cleaning, and/or for sanitation, while in times are prolonged drought groundwater is also often used for drinking and cooking even though water quality may be poor.
- ***Alternative and experimental systems*** are available at ad-hoc bases in limited atolls – includes desalination and distillation.

Rainwater Harvesting and Storage

56. In the outer atolls and islands of RMI, where approximately 28% of RMI's population lives, dependence on rainwater as the primary source for drinking water is high; it was estimated at 98% in 2011, which is higher than in urban areas. As

discussed in the previous section, water surveys conducted in 2013 in 11 atolls and islands[13] reported that 89% of households had rainwater-harvesting systems of at least one tank storage. For the average household[14], at a water consumption level of 20 lpcd[15], the larger size rainwater tanks (5,678L) could last up to 47 days.

57. Approximately 79%[16] of community buildings in the outer atolls and islands have community rainwater harvesting systems, especially in upgraded public schools, health centers, police centers, churches, and recreation or community centers. However, many systems are in poor condition, with installation, maintenance and efficiency challenges, similar to household systems.

58. Based on surveys undertaken in 2013 and 2016, household and community RWH systems typically have:

- Corrugated sheet roof, normally around 54m^2 for households and 100m^2 to more than 400m^2 for community buildings, typically in good condition
- 75mm-100mm guttering system providing less than 50% coverage of the roof area and often poorly installed, or in poor condition (the poor condition leads to low catchment efficiency and subsequent water loss/overflow)
- No first flush or mosquito guard systems
- At least one to two plastic (PVC) storage tanks (4,542L and/or 5,678L), although some households have no tank at all
- Low RWH efficiency (the % coverage multiplied by the % catchment efficiency) – typically 20% for household systems and 35% for community RWH systems
- Poor maintenance, resulting in poor system performance.

Concrete Tanks

59. In RMI, many atolls and islands have underground or partially underground concrete structures used to store water, with some built in the 1940s during World War II. These concrete tanks are ageing and while most are left unutilised due to poor condition, lack of nearby roofing surface to capture water, or being located too far away from settlements or too close to the sea making the stored water too brackish, some are still in use today connected to rainwater harvesting systems of households and community buildings. During the infrastructure surveys in 2013 and 2016, 23 large concrete tanks across 12 atolls and islands ranging in volume from 11m^3[17] to 453m^3 were recorded as still being in use and attached to buildings with a roof area greater than 100m^2. The concrete tank volumes are included in the baseline storage in the relevant communities with a total recorded volume from the infrastructure survey data of 1,254m^3.

60. With both household and community systems, the current and planned water storage capacity on average is 1,300L per capita in the rural communities of the islands and atolls of RMI. This capacity is adequate to provide 20 lpcd for 47 consecutive days (assuming 6 people per household) without rain if the preceding wet-season rainfall was normal, and the rainwater harvesting systems are in good repair and efficiently functioning. However, surveys of RWH systems indicated that most systems are not operating at an optimal status and are inefficient and therefore the combined household and community systems often supplied the community with only 30 days supply.

61. The Marshall Islands Red Cross Society (MIRCS) and the International Federation of Red Cross (IFRC) have implemented a rainwater harvesting improvement program in the atolls/islands of Likiep, Mejit and Namu in response to the 2013 drought. Existing rainwater harvesting systems were improved, hygiene and education in schools and communities promoted, and community catchments were built. At the household level, GoRMI with support from international donors have an active rainwater harvesting tank program serving remote island communities, where households now have a water tank of over 3,785L (1,000 gallon) capacity. Additional provision of rainwater harvesting systems in boarding high schools located in Jaluit, Wotje and Kwajalein, was planned to commence in 2017 as part of the GIZ-Climate Change in the Pacific Island Region (CCPR) program. Moreover, as a response to the 2016 El Niño drought event, IOM and MIRCS, with funding by the New Zealand Embassy, piloted a program aimed at improving rainwater harvesting systems in the outer islands of RMI. However, funding was only sufficient to cover 50% of the 136 selected households in Wotho, Ujae and Lae atolls.

[13] Ailuk, Aur, Ebadon, Lae, Lib, Maloelap, Mejatto, Ujae, Utrik, Wotho, and Wotje. Source. 2013 Wash Survey.
[14] Average household size in outer islands and atolls calculated from 2011 Census was 6 for the outer islands and atolls, 7 for urban atolls, and 7 for the national average.
[15] WHO and SDG minimum standard to provide for drinking, cooking and basic hygiene
[16] Based on 2011 RMI Census
[17] One m^3 is equivalent to 1000L

62. Despite these past and ongoing initiatives, existing rainwater catchment systems and tanks are insufficient for providing water security, particularly in the face of climate change. With projected climate change-induced increases in the variability of rainfall, the current RWH systems will be inadequate to meet future water demand and to maintain sufficient supplies for prolonged drought events.

Groundwater

63. Groundwater serves as an important source of non-potable water. Fresh groundwater in the outer atolls exists as freshwater lenses that float atop deeper, saline groundwater. The availability of fresh groundwater depends on island size and rainfall, and diminishes during droughts. Groundwater quality ranges from moderate to extremely saline (depending upon the season, tide, location and depth of the well), however there is limited data on quality and quantity of groundwater in most locations. Based on testing performed by EPA at a few of the atolls (Ebon, Jaluit and Namdrik) during the 2016 disaster response more than 50% of the wells tested did not meet the required drinking water standard (EPA set TDS > 500 mg/L).
64. Groundwater is collected from wells owned by households or communities. The water is accessed by buckets (or in some cases hand pumps) which often restricts access by the mobility challenged people within the community. People tend to use collected groundwater for bathing, washing laundry, and watering animals and garden crops, and only use it as a backup source for drinking during droughts. Excessive use and extraction of groundwater, which occur during the dry season and drought times, have resulted in saltwater intrusion and increase the salinity of groundwater resources.
65. Some wells are protected (having a 100mm concrete apron and an access cover), while others are open (unprotected) and therefore at risk from surface contamination. King tides and inundation of seawater of the atolls can also adversely impact the quality of groundwater and are expected to be more frequent due to sea level rise and the height of the current groundwater water well design may be too low to adequately protect it from future submersion and subsequent inundation.

Desalination Systems

66. In recent years, as a measure to manage the frequent water shortages during dry season, both mobile and stationary desalination systems with varying water production capacities and technologies have been deployed in selected outer atolls and islands with different degrees of success in terms of its installation, operation, maintenance, effectiveness and sustainability.
67. Three of the driest atolls in the north of RMI as well as one island in the south have stationary desalination systems powered by renewable energy (solar and wind) installed in late 2010 (Utrik), 2015 (Kili) and 2017 (Enewetak). All of these units operate year-round with freshwater production of approximately 13,627L per day (3,600 gallons) at Utrik and 21,198L per day (5,600 gallons) for Kili and Enewetak each providing baseline water needs to the community. They are operated approximately 10 hours each day. There is a diesel-powered reverse osmosis unit on Rongelap; it is rated for 22,700L (6000 gallons) per day and was installed in 2009, purchased by the US Department of the Interior. Local residents operate and maintain the system costing in the order of $10, 000 yearly. This cost does not include diesel.
68. The communities are facing financial difficulties in supporting operations and maintenance costs of the desalination systems and are dependent on grant funding from external donors. They are also depending on future capital investment from external donors to support expected major repairs through the life-cycle of these assets e.g. battery replacements, major breakdowns, etc. This is not a long-term sustainable approach. Additional smaller desalination units (3) will be installed by IOM at the three high schools on Wotje, Ebeye (Gugeegu) and Jaluit to support emergency supply during drought strictly to service the staff and students and will not be able to provide additional water to the surrounding communities.
69. In 2014 and 2015, with grant funding and technical support from the Government of Japan's Pacific Environment Community Fund, the RMI government installed stationary solar-powered reverse osmosis (RO) units in 15 public schools[18] with 567-1,135L (150–300 gallons) per day capacity. These units were designed to only be used during the dry season and as drought emergency response, however during the project design period the majority were found to be non-operational due to breakdown and lack of spare parts.
70. In addition, through funding from the Global Environment Facility (GEF) Special Climate Change Fund in partnership with the Pacific Regional Environment Program and UNDP, seven solar distillation systems, with capacity of 4L per day,

[18] Public schools in: Jaluit Atoll, Mejit Island. Ailuk Atoll, Likeip Atoll, Wotje Atoll, Maloelap Atoll, Aur Atoll, Majuro (Rairok), Santo Island, Mejatto Island, Wotho Atoll, Ujae, Lae Atoll, Lib Island and Namu Atoll (Majkin)

were installed in 2014/15 in 4 atolls and islands[19]. It was noted that during the development of this GCF project proposal, none of these units were still operational.

71. Due to difficulties and inadequacies related to the operation and maintenance of desalination units, they may not be viable options for drought relief. Most of the systems to date were unable to provide emergency water supply to the schools and health clinics and communities in which they were placed during the 2016 drought. In response, the government of RMI has identified several key success factors critical to the use of desalination as a viable water supply option in the outer atolls and islands including on-site training by the supplier, development of standard operating procedures, well-defined and accepted roles and responsibilities for O&M and adequate budget allocations for the lifetime of the system. Nevertheless, systemic issues will remain with the use of desalination in remote islands of RMI including high capital and O&M costs, securing of precise spare parts and technical capacity for O&M.

Water supply coverage

72. RMI has two major urban areas at Majuro (Capital City) on Majuro Atoll and Ebeye on Kwajalein Atoll. Both of these communities have water utilities that operate and manage the water and sanitation facilities for the community members in their service area. The two water utilities are Majuro Water and Sewer Company (MWSC) and Kwajalein Atoll Joint Utility Resources (KAJUR) respectively. The remaining communities in the Outer Atolls and communities not connected to the MWSC or KAJUR service area do not have the benefit of a managed system of collection and distribution water and sanitations services.

73. In urban RMI, increasing access, reliability and service levels of the piped water systems can provide significant water security improvements to residents living in their service areas by serving as a primary or secondary freshwater resource. Both MWSC and KAJUR have master plans that aim to upgrade and improve their networks to provide greater resilience for urban areas against drought and other climate change impacts.

74. In rural RMI or outer atolls and islands, water security solutions depend on improving existing systems as well as better utilizing available resources through a more participatory and holistic, water resource management approach.

Water Governance

75. RMI recently embarked on strengthening their institutions, with a strong recognition and awareness of the critical role it plays in strengthening water resilience at the national, subnational, and community levels. An overarching national institution for water governance was recently formalized through the Water and Sanitation Policy and National Environmental Protection Act amendment, which now officially designates EPA as the national authority to coordinate and oversee RMI's water governance under the purview of the Chief Secretary's Office.

76. Formal stakeholders and institutions related to water governance at the sub-national level is less established, in terms of its number of personnel available and clear understanding of coordinated responsibilities. As a result, there tends to be a disconnect between community-based water governance and national-level water governance mechanisms. As the majority of people in RMI rely on freshwater harvested through their household RWH systems as their primary source of water for drinking and cooking, formalization and/or enhancing the understanding of the subnational water governance mechanisms is important for strengthening water resilience.

Existing Extreme Weather Coping Strategies

Areas serviced by water utilities

77. During droughts, people from outer atolls often migrate to the two urban centres where there are public water reticulation systems run by water utilities. Migration increases the strain on these water supply systems.

78. MWSC and KAJUR have operating procedures for periods of drought. In the urban areas serviced by water utilities, water distribution to customers will be reduced to 4 hours one day per week (day varies depending upon area) when total storage falls below 50%, and the weather forecast is for no rain.

79. During the 2016 drought, 21 temporary water collection points were installed at various locations across Majuro. Water was supplied from a 75,700 L/d (20,000 gpd) RO unit at the College of the Marshall Islands and delivered daily by trucks operated by the MWSC and Majuro Atoll Local Government. Water points were open for limited hours and were subject to long lines.

80. In Ebeye, some residents, especially during water shortage times, travel to the Kwajalein U.S. military base, 4 miles (6 kms) south of Ebeye, to fill their containers free of charge and carry them back home on ferries.

Reliance on neighbors or community tanks

[19] Health Centers of Mejit, Ailuk (Ailuk and Enejelar), Likiep (Likiep and Jebal), Wotje (Wotje and Wodmej)

81. Households who do not have tanks, or whose tanks are empty may get water from family and/or neighbors whose tanks are not empty. Alternatively, community tanks at churches, schools, health clinics or government buildings, etc may be used to provide household water. Women and children are often sent to collect water.

Mobile Desalination

82. MWSC currently has 54 RO desalination units, each with a design capacity of 1360 L (360 gallons) per day, which can be deployed as needed during drought. However, it was determined that the actual capacity of the mobile ROs is 453L/d. The mobile RO units potentially provide sufficient water for about 140 people assuming a water need of 10 lpcd to cover drinking, cooking and basic hygiene, or for 600 people assuming a water need of 2.3 lpcd covering only drinking/cooking needs.20

83. The units come complete with solar panels and batteries allowing them to run on a 24-hour basis. Deployment is normally by a team of technicians, utilising a charter flight, who set up the unit in situ and handover the unit to locally trained residents with oversight by the local Council. After the drought emergency has passed, the desalination unit is picked up and brought back to Majuro for maintenance and storage.

Bottled water

84. Where available, water may be purchased from shops (bottled or fill containers). These shops are not typically present in the smaller rural communities and bottled water is generally only available on the outer atolls and islands when provided by emergency relief teams. Purchasing water (if available) is very expensive and therefore least favoured and not viable for longer periods. Considering the typical income of <$1/day in the outer atolls purchasing bottled water by residents is not a sustainable solution.

Groundwater

85. During drought periods, when the community and household water tanks are empty, groundwater is the primary source for all water requirements. During prolonged droughts, groundwater resources that are still providing suitable water for drinking are identified, communicated and shared by the community. The normal practice is to not boil their water prior to consumption, aggravating the incidences of contaminated water borne ailments.

Water Supply Benchmarking to Selected Pacific SIDS

86. It is useful to compare water supply provision in RMI to other SIDS. The Pacific Water and Wastewater Association (PWWA) benchmarks the water providers in the Pacific Region[21]. Unfortunately, data is only available for areas that are serviced by water utilities. In the Pacific SIDS of Kiribati, Tuvalu, Solomon Islands and Nauru, the following levels of water provision are provided:

Country	Population Served (%)	Water Per Person (lpcd)	Comments
Marshall Islands	74%	27 (38 planned[22])	Provision only in Majuro and Kwajalein. Rural areas rely on rainwater harvesting, some groundwater and in a few locations, desalination water
Kiribati	43%	2 (60 lpcd planned [23])	Provision of water only to capital town. Rural areas rely on rainwater harvesting
Solomon Islands	19%	130	Provision of water only to capital and provincial towns. Rural areas rely on rainwater harvesting
Tuvalu	50%	5	Public Works tanker distribution of rainwater & desalination water
Nauru	98%	16	Desalination water

[20] This volume of water meets the requirements for short duration (<2 weeks) water availability based on WHO Guideline and Sphere Standard
[21] http://www.pwwa.ws/index.php?page=Benchmarking2
[22] Majuro's daily water consumption level planned for in the Majuro within Drought Management Plan
[23] South Tarawa Master Plan target

87. There are a number of national and international guidelines for the quantity of safe water required per capita per day to ensure access to sufficient water needed for maintenance of health and well-being. The WHO and SDG[24] suggest that 20 lpcd is sufficient daily water to support drinking, cooking and personal hygiene for durations of three months or more (i.e. not short-term emergencies).
88. This benchmarking demonstrates that current water provision by the two water authorities in RMI is consistent with other Pacific SIDS. The planned supply level of 38 lpcd (for MWSC) is adequate under normal conditions, however with an increasing duration, frequency and intensity in droughts due to climate change, the vulnerability of the water supply system reaches a point where supply during climatic extremes is no longer possible. This situation is only worse on the outer atolls where storage volumes are less.
89. Without this proposed project and GCF interventions, the existing water supply to approximately 28% of people in RMI will be compromised by climate change impacts during dry periods and after storm-surge/inundation events.

Baseline Investments

90. Various projects and initiatives to enhance water resilience in RMI are being implemented, ongoing or planned. Many of these initiatives are focused on water resource management and drought risk management, while institutional capacity building initiatives are still very limited. Annex II (Feasibility Study) contains details of the various projects, the following provides a brief overview of projects relevant to water security for the outer atolls and islands of RMI:

Project Title	Period (Funding)	Main interventions and location
Japan Grassroots Grant	1997 to on-going (approx. $1.5M)	Grass Root Grants: Water Tank Truck for Enewetak Atoll, Two 20,000 Gallon Cisterns at Woja and Bouj (Ailinglaplap Atoll), One 50,000 Gallon Cistern at Mejit
Government of Japan Non-Project Grant Aid	2009 to on-going	Solar electrical systems connected to MEC 3 diesel powered desalination units 13200 Gal/day Equipment for water quality test kits
GIZ – Adapting to Climate Change and Sustainable Energy Project	2016-2017 ($800k)	Enhancing RWH systems at the three boarding schools. (Jaluit, Wotje and Kwajalein (Gugeegue))
Public Works - Public Schools and Atoll Health Care Centre Upgrades	2016 - ongoing ($1.9 M)	Replacement and upgrade of school infrastructure and health facility - 30 new tanks were installed in 2017 (size ranging from 47 to 189 m^3) in 27 communities in 17 atolls with a total installed capacity of 2,744 m^3. The need for additional catchment concrete tanks was determined based on PDNA analysis from last drought 2015.
Desalination		
US Government for Agriculture Department of Enewetak	2007 (Approx. $30k)	Enewetak - 2000 Gal per day unit diesel driven desalination unit. .
US Department of Interior	2010 ($30K)	Utrik - 2 X 1800 Gal/day units plus storage tanks (one running at one time) – producing 1000 G/day.
US DOI Funded	2015 ($500K)	Kili - Purchase and installation of Solar and Wind powered RO system with storage tankage.
Pacific Environment Community Fund (PEC) (2011-2016).	2014/2015 ($4 million)	Multiple atolls - Purchase and installation of 15 photo-voltaic powered RO systems (300 Gal per day capacity) to be installed at schools.
US Foreign Disaster Assistance (OFDA), Australia DFAT and IOM	2016/2017 (part of $3.3M)	3 diesels powered desalination units for high schools on Jaluit, Wotje and Kwajalein. Each RO provides 800 gallons per day.
Reverse Osmosis Units and Disaster assistance for Northern	2013 TO 2014 ($5.5M)	Emergency Assistance and provision of Reverse Osmosis Units to alleviate immediate and medium-term effects of the drought in the Northern Islands.
Water Governance		
The Strengthening Water Security of Vulnerable Island States	2016 – 2018 ($1M)	Suite of practical measures (water security toolkit) to strengthen drinking water security in the Cook Islands, Kiribati, RMI, Tokelau and Tuvalu.
Capacity Building		

[24] WHO Technical Note No. 9, WHO/SEARO Technical Notes: Minimum Water Quantity needed for domestic uses

Reduced Vulnerability of the Pacific Island Country Villages Livelihoods to the Effects of Climate Change	2015	Improving the capacity of the Pacific Island Countries' National Meteorological Services
RMI Drought Response Project	2013 ($300K)	ADB's Asia Pacific Disaster Response Fund in response to Northern Island Drought - consisted of activities relating to the provision of life preserving services for communities.
RMI Pacific Resilience Project (PREP) Phase II	Under Development ($36M)	Institutional Strengthening early warning and preparedness, Strengthening coastline resilience, Contingency Emergency Response and Project Management Support
University of the South Pacific - European Union Global Climate Change Alliance Programme	2007-2017 ($8M)	Formal and informal trainings to community members on the impacts of climate change and variability in outer islands and atolls of RMI
Climate Adaptation, Disaster Risk Reduction and Education	2012 ($500K)	This project aims to build the resilience of vulnerable communities in the RMI to natural hazards, particularly those that are climate induced.

91. Ongoing and past initiatives relating to the attainment of water security through improvement of rainwater catchment systems, storage and alternate technologies (e.g desalination), institutional and community capacity building have not been fully scaled to all the outer atolls. With climate change-induced projected increases in variability of rainfall, the current efficiency rate of the infrastructure to capture and store rainfall will be inadequate to meet future water demand and to maintain sufficient supplies for prolonged drought events (refer Annex II - Feasibility Study).

Gap Analysis

Water Resource Management

92. Water shortages occur in RMI because access to safe freshwater resources is largely dependent on rainwater. In many communities in both urban and outer atolls and islands of RMI, households rely primarily, and often solely, on their household and community RWH systems. Moreover, the efficiency of the harvesting systems is very low at 20% for households and 35% for community buildings resulting in very low rainwater capture.

93. Efforts have been implemented and are underway in RMI to reduce this vulnerability to drought by expanding the freshwater resource options. The availability of options and strategies for freshwater supply vary from urban and rural Marshallese populations. The urban areas of Majuro and Kwajalein atolls are within the service area of the public water utility companies – MWSC and KAJUR, respectively. Rural areas in RMI include all the remaining local government jurisdictions in the outer atolls and islands as well as communities in Majuro and Kwajalein atolls that are not within the service areas of the public utility companies.

Urban Areas (Majuro and Kwajalein)

94. In urban RMI, increasing access, reliability and service levels of the piped water systems can provide significant water security improvements to residents living in their service areas by serving as a primary or secondary freshwater resource. While the piped water system upgrade is already in implementation in KAJUR, MWSC is still in the planning phase. For MWSC, gaps remain in identifying financial resources to implement the Master Plan, which was finalized in July 2017.

Outer Atolls

95. Although various initiatives have been implemented in the outer atolls of RMI to improve water security options, remaining gaps exist as described below:

- Poor operation and maintenance. Some successful initiatives to train communities in operations and maintenance of RWH systems have been trialed in selected atolls and islands, but there is a significant gap in scaling this up to other local government jurisdictions and communities.
- Lack of trained technicians for operation and maintenance of desalination units outside of major urban centres. Finances for operation (e.g. fuel and spares) also often lacking.
- Household RWH tanks in rural RMI. Most households surveyed have at least 1 if not 2 tanks. The exact gap for the number and conditions of the household RWH systems and tanks, needs to be assessed per community as this information is not available and has been extrapolated based on available information during the project development phase.
- Community RWH and storage - gaps in storage capacities to fully utilize the roof catchments exist. In some communities, there is a gap and need to construct roofing for RW capture, along with additional tanks for storage.

The exact gaps for the number and condition of the community RWH systems and tanks need to be confirmed as these were extrapolated for communities without infrastructure survey data

- Groundwater data available for outer atolls is very limited in terms of defining location, water quality and water lens quantity parameters.
- Under the National Water and Sanitation Policy, the importance of developing a comprehensive strategy and methodology for groundwater monitoring is elaborated; however, gaps remain in terms of identifying the financial and technical resources for implementation.
- Gap in sanitation facilities and hand washing stations suitable for the community needs. Rainfed flushing systems are inoperable during drought.
- The proposed GEF-funded "Managing Coastal Aquifers in Southern Pacific SIDS" project will build on better understanding of the existing aquifer systems but does not include components to build protection of well systems from contamination.
- Gap in understanding of the triggers and atoll, and community-specific practices for employing conservation measures based on each type of drought forecasted.
- Development of educational and awareness communication materials along with Standard Operating Procedures to assist communities to manage non-essential water use and to monitor RWH systems for proper function are lacking.
- Low-cost, low-technology and self-sufficient alternative options for freshwater resources (e.g. HOOP Solar Distillation System) lacking. To date systems trialed have insufficient capacity or have failed for a variety of reasons.

Targeted Communities

96. As indicated above, the two primary urban areas, Majuro and Kwajalein, both have existing water utilities (MWSC and KAJUR). These utilities provide water to the communities in their areas and both have Master Plans for future enhancement and expansion of their systems, hence are not being considered under this project. Therefore, it is the outer atolls and islands that will be targeted by this project.

97. A total of 77 rural communities across 23 atolls and islands will be targeted by the project (Table C2.1). This covers all communities of 5 households or more across all atolls, with the exclusion of the areas covered by existing water authorities (MWSC – Majuro and KAJUR – Kwajalein). Atoll profiles, with maps showing locations of the 77 communities and tabling the proposed infrastructure at each, are appended to the Feasibility Study (Annex IIa and IIb).

Table C2.1. Target atolls/islands and number of communities

Atoll/Island	Largest rural community	Number of target communities (>= 5 HH)		Atoll/Island	Largest rural community	Number of target communities (>= 5 HH)
Ailinglaplap	Woja	10		Likiep	Likiep	3
Ailuk	Ailuk	2		Majuro	Aenkan	1
Arno	Arno	12		Maloelap	Tarawa	5
Aur	Aur	2		Mejit	Mejit	1
Ebon	Toka	6		Mili	Mili	6
Enewetak	Enewetak	1		Namdrik	Namdrik	1
Jabat	Jabat	1		Namu	Majkin	4
Jaluit	Jabwor	6		Rongelap	Rongelap	1
Kili	Kili	0		Ujae	Ujae	1
Kwajalein	Santo	6		Utrik	Utrik	1
Lae	Lae	2		Wotho	Wotho	1
Lib	Lib	1		Wotje	Wotje	3

Key Barriers to Achieving Water Security and Climate Resilience

98. The adaptation alternative is that the climate resilience and water security of the outer atoll communities of RMI is secured through improved harvesting and storage of rainwater, supplemented by other sources, along with improved water resource management.

99. The key barriers that Marshallese people living in outer atolls and islands are facing include:

- *Insufficient water infrastructure, not resilient to prolonged drought, leading to lack of and chronic shortage of safe freshwater for people living in the low-lying atolls and islands.*
  The frequent water shortages in the outer atolls and islands are caused by a combination of inefficient water infrastructure unable to meet the minimum demand of 20 lpcd, and insufficient and often one-off water-related investments, financed through time-bound projects. Water investments in RMI to date have been allocated reactively after a drought event, rather than strategically placing investments to avoid or mitigate shortages during droughts and/or to holistically strengthen and improve the freshwater resource system in which communities rely on during drought and non-drought times.

  During the 2015/2016 drought, estimated drought days of water shortage experiences by communities under the baseline/status quo (existing and planned[25]) water infrastructure conditions ranged from zero (0) days in Kili to 175 days in Ujae. More than 52 rural communities across 13 local government jurisdictions were estimated to have experienced more than 100 days of drought during this period. The majority of current initiatives are meant to respond to an immediate crisis (drought) with limited scope for building infrastructure or enhancing governance systems to ensure long-term water security and resilience.

- *Insufficient rainwater catchment systems for current storage capacity due to rainfall variability.*
  Low efficiency of rainwater harvesting systems, including poor sizing of gutters, downspouts, brackets and fittings, which are poorly installed, are unable to capture the maximum rainfall. A key recommendation from the IOM pilot of RWH improvements was to use higher-end guttering, droppers and downpipes rather than those that are currently readily available in RMI. Projected reductions in rainfall for both wet and dry periods (modelled for 2035 and 2045) will exacerbate the need for assuring rainwater harvesting efficiencies and water storage capacities are maintained at a high level.

  Water storage capacities for households and community buildings are insufficient to capture the maximum water that could be harvested, with water extra water being lost once tanks are full. Surveys of households (past assessments and during the design of this project) indicate that most households now have one, if not two tanks.

  Several initiatives are ongoing at the community level to improve and expand rainwater harvesting storage. However, gaps remain to further expand storage capacities through improving underutilized community storages (i.e. leakage reduction) and adding additional storage tanks to fully utilize the roof catchments. In some communities, there is a possible gap and opportunity to construct additional roofing for RW capture, along with new tanks for storage.

- *Open groundwater wells susceptible to contamination by wave overtopping, especially during king tides.*
  Storm surges and king tides have been documented as causing widespread damage in the Marshall Islands, Kiribati, Vanuatu and the Federal State of Micronesia (FSM)[26]. In March 2014, RMI declared a state of emergency following tidal surges causing inundation to communities on low-lying atolls of RMI. The outcome of the event resulted in damage to agriculture and water harvesting infrastructure, contamination of community tanks, nearly 80% of sanitation facilities being affected, 70 damaged homes in the capital of Majuro and 160 displaced people. Damage to the outer islands was even more severe. Based on predictions for Kiribati, RMI can expect a significant increase in the frequency of king tides (currently 3%-5% of high tides) as a result of climate change where 90% of normal high tides will have the same classification as king tides by 2090.

  Limited information is currently available in terms of location of wells, its quality, quantity and usage of groundwater. Some initiatives have been implemented where groundwater quality have been tested. Data availability is inconsistent in terms of methodology, parameters measured, locations, and frequency, especially in the rural areas of RMI. Groundwater resources can potentially serve as critical alternative to freshwater resources especially in times of low precipitation in the norther atolls and islands.

[25] Planned interventions reviewed and incorporated into the calculation of number of days where community RWH systems are empty (or drought days).
[26] https://www.adb.org/sites/default/files/linked-documents/E-Pacific-Risks-Vulnerabilities-Climate-Change.pdf

- *Limited access and availability, and systemizing knowledge of alternative sources of water for household and community usage.*
  During periods of drought, the incidence of diarrhea and of water-borne disease is heightened as alternative sources of water for drinking, cooking, and bathing purposes is limited, or absent and communities resort to water of lower quality. The EPA has increased the water quality testing in recent years, however it has not been programmatic or consistent due to costs and logistics. Nonetheless, samples revealed a high percentage of households located in outer atolls and islands with contaminated water catchments.[27] The EPA, as part of the NDMO validation team, performs spot water quality testing of stored water and groundwater at communities when possible water shortages are declared. They also note the quantity of stored water and report this to the OCS to support declaration of emergency measures.

  Information available to the communities in outer atolls and islands on water conservation practices and community-specific water demand management, including the encouragement of sustainable operations and maintenance practices, is also limited. There are few campaigns for water conservation and virtually no promotion of water efficient appliances.

- *Limited participation and empowerment of women and youth in efficient water management practices*
  Women in RMI generally manage household tasks including care of childcare, the elderly, gardens and small livestock so are heavily impacted by water security issues. However, historically they have limited engagement in water and sanitation decision-making at community or island level and limited exposure to water and sanitation awareness training. Organizations such as WUTMI provide strong on-the-ground support for grassroots level awareness campaigns, however, due to lack of financial resources, such efforts are often project-based. This project recommends building on best practices, such as community participation in all steps in upgrading water systems, improving drinking water, and the establishment of Community-based Water Committees (CWCs). Women's active and equitable participation on CWCs is critical support the decision-making in community specific water safety planning.

- *Unsustainable and ineffective operation and maintenance practices*
  Operations and maintenance costs, especially for stationary reverse osmosis systems, are often funded through grants and/or by external providers (for limited periods). This is not a sustainable solution.

  Programmatic and financially sustainable long-term sources of funding to support operations and maintenance of households and community rainwater harvesting systems has not been supported. Improper maintenance of rainwater harvesting systems, often leads to contamination of drinking water and illness.

  Rainwater harvesting systems are often uncovered and unprotected against contamination or vectors such as mosquitos. As already noted, there is no comprehensive program of monitoring RWH systems condition, quality or quantity of stored water or groundwater quality. Outer atolls and island communities are responsible for the operation and maintenance of their RWH and storage systems. There are no SOPs in place and knowledge and capacity is often lacking resulting in ad hoc and inconsistent practices. Residents in the rural communities need training in basic carpentry to enable them to maintain and repair RWH systems (especially gutters and downpipes) to capture rainwater from the full roof area. Training is also needed in repair of non-operational or leaking cement rainwater storage tanks.

  As a response to disaster, training on operation and maintenance of the mobile desalination systems has been provided to community members by MWSC technical staff. However, due to in and out-migration, training needs to be repeated. Small-scale desalination systems, including the Hoop systems are often dysfunctional due to poor maintenance practices, no regular follow-ups and refresher training, and lack of funds for spare parts. Moreover, during the implementation of disaster response, community members were supplied with rainwater harvesting systems and storage tanks, but there was limited training on installation, use and major/minor repairs.

Adaptation Options

100. There have been various initiatives implemented in RMI (Table C2.2), some of which can be considered as a suitable model to be scaled up by the proposed project.

Table C2.2 Adaptation options considered

[27] Integrated Water Resources Management. Republic of the Marshall Islands. Diagnostic Report. March 2007

Technology Option	Water Source	Lessons Learned
Household rainwater harvesting system	Rainwater	Utilization of 150mm diameter gutter and downpipes for the RWH systems ensures improved performance. Higher-end guttering, droppers and downspouts should be used rather than those readily available for purchase in RMI. Training and awareness of proper operations and maintenance practice
Community rainwater harvesting system	Rainwater	Provision on larger catchments connected to community buildings – Improved150mm piping for the gutters of the RWH systems. Higher-end guttering, droppers and downspouts should be used rather than those readily available for purchase in RMI. Greater understanding of capacity requirements for community.
Groundwater infiltration galleries	Groundwater	Protection from contamination, improved performance and understanding of water lens thickness and capacity.
Groundwater wells	Groundwater	Water quality testing improvements, capacity of water lens, alternate source of water for washing, cleaning and for agriculture. Needs protection from contamination and inundations, requires consistent maintenance.
Groundwater wells with pumps (hand pumps, solar pumps, Hydraulic Ram Pumps)	Groundwater	Good efficient use of groundwater resource. More efficient than using bucket and rope – ensures protection from contamination.
Desalination: Solar distillation (solar water purifiers)	Sea water or brackish groundwater	System not installed optimally and has to establish clear lines of ownership for maintenance and supportive funding. Need ongoing maintenance even when not required during the wet season. All units are not working and not supported – clearly currently not an effective solution. Large farms of solar panels would be required to support 20 lpcd for the community – not feasible for total solution.
Desalination: Reverse Osmosis units – mobile	Sea water or brackish groundwater	Ideal for disaster response and not suitable to meet long term water security needs – requires common warehouse to optimally store and maintain the units. Requires consistent training and upkeep.
Desalination: Reverse Osmosis units – stationary	Sea water or brackish groundwater	Good source of quality water. Costly to maintain and operate, requiring considerable technical skills to support for optimal operation. Community requires external support to provide funding – perhaps not a sustainable solution.
Hoop system (hybrid mini poly tunnel)	Air moisture – condensation units	Limited capacity to provide water source. Can be used for awareness training – education.

Selected Adaptation Solution

101. The proposed GCF project will address and overcome the barriers described earlier by strengthening community resilience and bridging the water gap, by providing the minimal quantity of 20 lpcd for the rural communities of RMI[28].

102. This will be achieved through three interlinked Outputs, namely:

- Output 1: Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI
- Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall

[28] The urban centers of Majuro and Ebeye are not covered as these are served by water utilities.

- Output 3: Climate change induced drought preparedness and response measures implemented in outer atolls and islands.

103. These outputs were developed as a direct response to the key barriers and gaps described earlier, previous experience in RMI, and through technical and economic assessments of the adaptation options (refer Annex II - Feasibility Study and Section E6 below).

104. It is the combination of all three Outputs that will lead to achieving communities in the outer atolls and islands having a reliable, safe freshwater supply and the necessary water governance and coordination mechanisms sufficient to see them through the projected future drought periods. All three Outputs are critical for achieving the urgent climate change adaptation priority of strengthening integrated water security for RMI.

Rainwater Harvesting and Storage

105. The primary focus of the project will be the improvement and expansion of rainwater harvesting systems and storage capacity to an adequate level to supply at least 20 lpcd in the rural communities of the outer islands and atolls of RMI through longer drought events triggered by climate change.

106. The current and planned[29] water storage capacity is on average 1,300L per capita in the rural communities. This capacity is adequate to supply 20L per person for 70 consecutive days without rain (baseline drought) (Annex II Feasibility Study provides details of baseline). However, to cope with the droughts projected to increase in length at varying degrees across the climate regions of RMI, the project will invest in increasing storage capacity per capita so that the gap between baseline storage and storage required to cope with climate change induced droughts is closed. This will be done by installing new storage tanks at the community level.

107. Figure C2.1 below provides an overview on available water resources at the onset of a drought, as well as the water requirements for the baseline and climate change-induced drought. Further, it also shows the water supply-demand gap to meet the defined water security target of 20 lpcd for each of these drought events. The baseline versus climate-induced water supply gaps form the basis for co-financing versus GCF financing respectively.

108. Some communities have sufficient water to meet the baseline and climate change-induced water requirements; others barely have enough to cover a few days of even the baseline drought. As such, the climate change induced water availability gap is overall smaller than the climate change-induced water requirement. This is due to the fact that some communities have water supplies which can meet the baseline and the climate change induced water requirements, thus reducing the total volume. Likewise, the baseline water availability gap is larger than expected if just subtracting the existing water availability from the baseline water requirement – as some of the existing water is used by communities with excess water supplies to meet the climate change induced drought. This demonstrates the importance of a community-based assessment of the water availability gap.

[29] Planned storage capacity refers water storage that was under development by the RMI government or other development partners at the time of proposal development. This would be functional within the next 2-3 years.

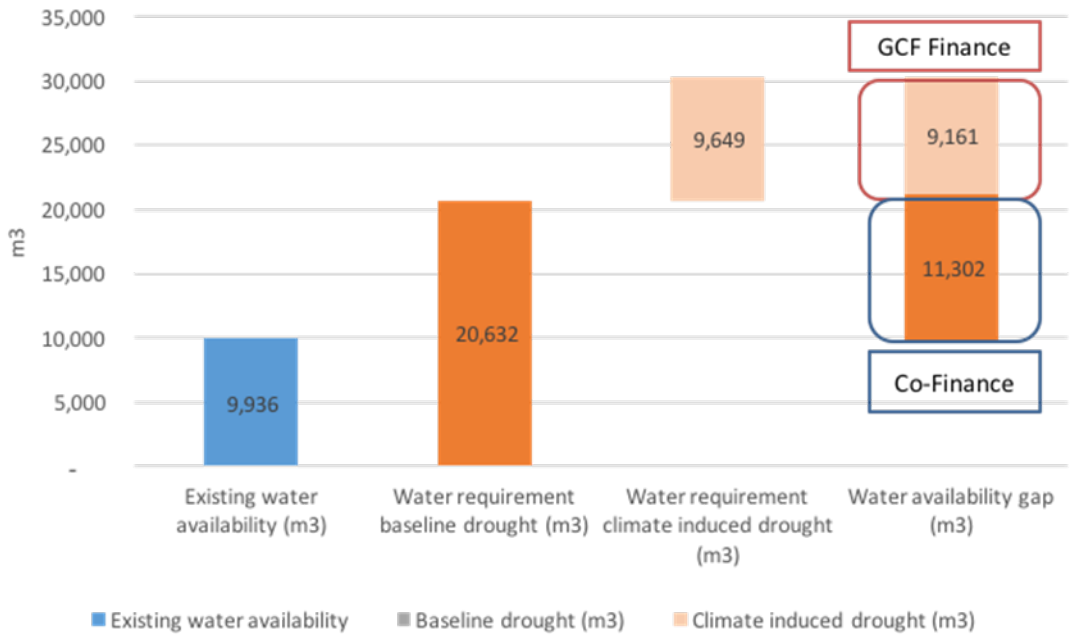


Figure C2.1. Overview of water availability and drought water requirements by 2045 across 24 target islands/ atolls

109. Rainwater harvesting systems will be improved on 2,529 household buildings. As for community buildings, the project will provide funds to local governments to improve existing rainwater harvesting systems and additional storage tanks in 158 existing community buildings and construct 121 new community rainwater harvesting system structures with corresponding new storage tanks.

Groundwater and Sanitation

110. The importance of rehabilitating and protecting groundwater wells, as a complementary water source has been demonstrated during previous drought events. While the direct impact on augmented water supplies from these measures is difficult to quantify due to lack of data on groundwater quality and quantity across islands/atolls, recognizing the importance of groundwater in supplementing minimum drinking water quality requirements for washing, watering of household gardens, during drought events, and the measures and steps to improve knowledge on groundwater have been incorporated in project interventions. The project will install covers and raise sidewalls to protect 2,586 groundwater wells identified within the 77 target communities.

111. While sanitation is not funded by the GCF as it is development related, it is nonetheless included here to emphasize its importance in this proposed project, particularly in relation to groundwater, both as a receptor of pollution and possible source of water for flush toilets to reduce demand from rainwater. Improvements in sanitation will be supported through other projects such as the GEF/UNDP project "Managing Coastal Aquifers in Selected Pacific SIDS" (MCAP) which will include interventions that will protect groundwater resources, from pollution sources, in several outer islands, including improvements in sanitation. Further, the completed GEF/UNDP Integrated Water Resources Management Project and the follow-up ongoing Pacific Islands Regional Ridge-to-Reef Program, which includes interventions in the Laura Village in Majuro atoll to address waste management to protect the freshwater lens. This could provide lessons useful in the other atolls. The Master Plans from Majuro and Kwajalein (Ebeye) will fully address the sanitation requirements for the MWSC and KAJUR service areas.

Institutional Capacity Building

112. The project will empower national and subnational institutions and stakeholders to champion water governance for efforts to be coordinated, effective, participatory, equitable, and sustainable. This will occur at the:

- National Level – through supporting and strengthening the implementation of existing policies
    - Support EPA to implement monitoring, reporting, accountability, and sustainability of National Water and Sanitation Policy.
    - Strengthen OCS/NDMO's coordination capacity to manage water related disaster risks

- Develop comprehensive National Water Safety Plans in line with the Community Water Safety Plans, National WASH Policy, National Environmental Protection Act, Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management (JNAP), National Disaster Management Plan, and other relevant policies
- Establish a comprehensive national database for water resources in RMI that will be updated, and sustained.
- Ensure comprehensive knowledge management and communication program is established supported with forums and training to nurture the next generation of water leaders and experts.

- Community Level – by supporting establishment of Community Based Water Committees (CWC's)
  - Develop and foster ownership and buy-in for sustainable operation and maintenance practices

Develop and utilize best practice SOP's for RWH and monitoring and managing groundwater resources.

113. Long-term sustainability will be enhanced by the proposed institutional capacity building. Community Water Committees will be formed in each of the 77 communities. The CWCs will manage and enforce, through the local community government, long-term asset maintenance practices and support of the installed infrastructure. In addition, over the 25-year life cycle of the project, the national government has budgeted replacement of assets as part of their operations and maintenance commitment. (Annex IIa Section 10.1.3 describes the institutional arrangements).

Project Against Baseline Summary

114. Generally in a normal year, dry season lasts for 2 to 4 months with an average of 10 consecutive days without rain. In a dry year with the dry season lasting up to 5 months, days without rain range from 10 to 90 days. Therefore, water security can be significantly enhanced throughout RMI if people can have access to adequate volume of safe freshwater resources during this time, such that emergency drought response can be avoided.

115. The project is designed to address critical shortfalls in water availability and water supply management in the outer atolls and islands. Specifically, the project focuses on: creating a paradigm shift in water governance and institutional capacity (both government and community), management of household and community rainwater harvesting systems, water storage capacity, and groundwater management and protection.

116. The project will deliver the following results:

- Improving water security through providing access to safe freshwater resources year-round for at least 15,572 people (2017 estimated population in the outer atolls or communities not connected to reticulated systems in Majuro and Kwajalein – 28% of RMI's population), including 7630 (49%) women.
- Improving water resilience by securing groundwater resources from contamination from inundation of seawater.
- Empowering national and subnational institutions & stakeholders to champion water governance for efforts to be coordinated, effective, participatory, equitable, and sustainable.

C.3 Project Description

Output 1: Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI

117. To assess the most cost-effective sequence of water supply augmentation measures and to ensure water security by 2045, a cost curve methodology was used (refer to Annex II for additional details on the methodology). The water security target to be achieved for baseline drought (unrelated to climate change) requires an additional 11,302 m^3 of water, whereas for climate change induced drought periods, it requires, on top of baseline needs, a further addition of 9,161 m^3 of water.

118. In order to close the water supply-demand gap, and to ensure the water security target is met, three types of interventions were identified:

1. Improvement of household rainwater harvesting systems
2. Improvement of community building rainwater harvesting systems and construction of new storage tanks
3. Construction of new community-based roof structures in combination with new storage tanks

119. Under this output, the GCF funds will co-finance, the improvement of rainwater harvesting structures on community and household buildings and increased community building water storage capacity. The project will invest in sufficient capacity to provide each resident with at least 20 liters of water per day throughout the projected drought length for the specific climate region. The proportional cost totaling 4.21 million USD of improving the rainwater harvesting systems and storage capacity to meet the water needs for a baseline drought will be borne by the Government of RMI. The additional cost of 5.21 million USD for developing the further capacity required for additional drought days attributable to climate change will constitute the GCF co-financing.

120. While O&M for the assets developed has been envisaged to be community or owner driven GCF resources will be used for initiate enabling activities for effective O&M to be carried out. Accordingly, GCF finance would be used to develop O&M plans, related SOPs and limited initial capital refurbishment in the form of provisions for materials and spare parts required for general maintenance to extend the asset lifecycle. The beneficiaries would be responsible for the operations and maintenance of livelihood assets and technologies promoted. Acceptance of a tiered operations and maintenance (O&M) system has been documented (FS- Annex IIa):

- Tier 1: Beneficiary Households and Community Building Owners/Management
- Tier 2: Community Water Committees (CWC) or equivalent representative
- Tier 3: Mayors and Community Leaders (Chiefs) – Mayor Council
- Tier 4: OCS and NDMO/ National Government

121. During the project period, as part of setting up of the O&M systems labour shall be provided by the individual households and beneficiary community owners/operators while GCF and GoRMI resources to the tune of USD 729,701will be utilized for the provisioning of material and spares parts required for demonstrating and establishing general O&M practices in year 5-7 of the project period. Of this USD 457,656 will be provided by the GCF and USD 272,045 will be funded by the GoRMI (refer annex XIIIb for O&M details)

Activity 1.1 Improve existing rainwater harvesting systems for community buildings and households in outer islands and atolls for usage during increasing frequency and periods of drought

122. The proposed activity will upgrade existing rooftop rainwater harvesting systems on 158 community buildings and 2,529 households in 77communities across the 24 local government jurisdictions. The targeted community buildings include schools, churches, community halls, police stations, youth centers, airport terminal buildings, copra houses, Marshall Islands Marine Resource Authority (MIMRA) buildings and other buildings owned by the public sector or civil society that have more than 100 m^2 of roof area.

123. On average, only 50% of the roof area of households and community buildings is connected with guttering system, and the overall average efficiency of rainwater harvesting systems is only 20% for households and 35% for community buildings, leading to significant loss of rainwater between the roof and the tank. This activity will install new components to areas of the roof that are not connected, and will upgrade existing components to reduce leakage/overflow and increase quantity of the water that is harvested. It is expected that these improvements to connection, gutters and downspout will increase the efficiency of rainwater harvesting systems to least 70% for households and at least 80% for community buildings.

124. The systems currently in use vary in guttering systems and downpipes size ranging from 75mm to 100mm in diameter resulting in overflow and higher O&M costs. The project will replace these with 150mm diameter gutters and downpipes. Furthermore, this activity will cover expenditures required to upgrade and refurbish rooftop rainwater catchment systems including gutters, downpipes, debris traps, first flush systems, filters, storage and access points. Local workers will be contracted by the project to implement the works, with emphasis on engaging both women and men.

<u>Activity 1.2. Provide additional rainwater harvesting systems and increase of storage capacity for communities in outer islands and atolls for usage during increasing frequency and periods of drought</u>

125. This activity will focus on providing additional rainwater harvesting catchments (roofs) and upgrading community level storage quality and capacity as the primary source of water during prolonged droughts. The GCF resources will be

used to supplement RMI government funding to improve the efficiency of utilization of existing community building catchment systems and construct additional roof systems to close the water gap. Local government will provide resources, with in-kind support from the community to cover the investment required under baseline climate conditions. The in-kind contributions are important to both keep investments working to meet household baseline requirements, and to increase the sense of ownership by communities and thus improve long-term sustainability of the project. The additional investment required by the GCF is for increased harvesting and storage capacity required due to climate change impacts.

126. Nearly all the community buildings that will be covered by the project currently have at least one 4.5m^3 (1,200 gallon) or 5.6 m^3 (1,500 gallon) storage tank. However, the current 35% RWH system efficiency leads to water loss from roofs, gutters and downpipes before reaching the tanks, while tanks that are too small to store the volume of water harvested during high rainfall events results in significant water loss from tank overflow. Furthermore, most tanks in community buildings do not have first flush diverters or mosquito guard systems. General practice on first seasonal rainfall was to divert the feed away from the storage system to overflow onto the ground resulting in further water losses. The project will install an additional of 50m^3 of storage capacity for the targeted community buildings and improve the RWH system to ensure it is functioning at 80% efficiency post project intervention. Table C3.1 summarises the project impacts on community RWH systems.

Table C3.1. Project Impact on Community Rainwater Harvesting and Storage Systems

Pre-project context	Intended post project context
Average of 50% of roof area used for RWH	100% of roof area used for RWH
Currently at average 35% efficiency due to poor condition	Efficiency improved to at least 80%
100mm guttering systems	150mm diameter gutters
100mm diameter downpipes	150mm diameter downpipes
One 4.5m^3 (1,200 gallon) or 5.7m^3 (1,500 gallon) tanks Most without first flush diverters or mosquito guards.	Minimum of 50m^3 of storage capacity installed First flush diverter installed Insect screens installed

127. Based on a technical and cost assessment considering high transportation costs (see Annex II) the proposed project will use flat pack tank systems - structural panels and a base made of either galvanized steel or High-Density Polyethylene (HDPE) with aluminum or steel structural components and food grade polypropylene liner.

128. Finally, this output will support market creation and will establish long term procurement agreements with a local provider that provides maintenance supplies, ensuring cost efficient agreements that may be applicable beyond the scale of the project.

Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall

129. Activities through this output are focused on optimizing alternative water sources to reduce the burden on potable water supplies, and the establishment of a network of national and regional specialists on climate change through formal and informal trainings, and awareness raising on climate change adaptation. GCF funds will be used to protect 2586 household and community groundwater wells and provide training for women and youth as part of best practice and community awareness programmes.

<u>Activity 2.1. Protect groundwater wells from more frequent climate change induced storm surges and contaminations</u>

130. The project will protect 2,586 household and community groundwater wells identified within the 77 target rural communities, located in 24 local government jurisdictions and vulnerable to contamination from sea swells and high tides. The importance of groundwater as complementary water source for non-potable water uses was demonstrated

during previous drought events and is highly relevant for building additional resilience. Its importance lies in meeting non-potable water demand, and reducing the pressure of drinking water supplies.

131. The proposed project will fund the protection of wells from surface pollution by lining the well for the full depth and to at least 0.6 m above the ground to form a head wall around the outer rim of the well. A concrete slab will be constructed on the ground surface, extending for 2 m around the well which will also serve to seal any fissures between the well lining and the walls of the excavated hole, preventing seawater from seeping into the well along the outer casing. This activity will also invest in well covers to further prevent contaminants from entering the well.

132. The investment per well is determined by its current status and its importance to the community. The importance to the community range from household wells used mainly for washing, to large community wells that are used for drinking, cooking and/or washing and serve an important water resilience function. Community members have advised that in times of need and prolonged drought, households wells are shared and used by the community.

Activity 2.2. Enhance women and youth's leadership through best practices and community awareness programmes on efficient usage (demand management) of rainwater

133. In order to enhance the value of the GCF investment and create a pathway to scale nationally and regionally, this output will create opportunities for learning exchanges and will facilitate inter-island exchanges on best practices in climate change risk reduction on water resources, including water security and conservation of water resources. Inter-island exchanges will be facilitated via a number of pathways: locations that have demonstrated success in developing and implementing Water Safety Plans will be used as 'model villages/atolls', lessons learned will be shared through visits to/from 'model villages'; CWCs will be coordinated nationally, therefore they provide a pathway for exchange of learnings between islands; periodic reviews of plans such as disaster SOPs, Water Safety Plans, O&M SOPs and Demand Management will provide opportunities to identify successes and failures which can then be shared (locally and nationally); NGOs and community networks (particularly women and youth) will be another mechanism for inter-island exchanges of learnings.

134. Training programs include the development of Water Safety Plans, which will be focused on training women and children who are generally responsible to collect water, cleaning and general household in the usage of water based on water quality and available quantity etc, RWH systems operation and maintenance, Demand Management, Disaster SOPs and drought preparedness. Focus of training will be related to water conservation and prioritization practices especially relating to WASH requirements. It is emphasized that sanitation will be provided paramount emphasis. Trainings will serve to increase coping capacities, and reduce hardships faced by communities in times of disaster and water scarcity. Given that as of 2016, approximately 60% of the population was estimated to be less than 24 years old, with 19% under 14 years old, women and youth have been selected as target group. The University of South Pacific campus in the Marshall Islands will provide formal and informal education to women and youth on climate change adaptation and water demand management. This activity will be undertaken in partnership with the Marshall Islands Red Cross Society, WUTMI, the National Youth Congress, and existing women and youth networks.

135. Building on the USP-European Union Global Climate Change Alliance (USP EUGCCA) project, youth expertise in water demand management will be developed through a Climate Change and Disaster Risk Reduction certification programme part of a non-formal course of study at the University of the South Pacific. Women and youth engaged in learning exchange visits will also gather practical management skills, such as project management, written and oral presentation, reporting, monitoring and evaluation of project, conflict management, etc.

Output 3 Climate change induced drought preparedness and response measures implemented in outer atolls and islands

136. Existing activities being undertaken by the Government of RMI meet baseline needs, however this is inadequate to deal with the increasing demands caused by climate change. Through this output, GCF will support the effectiveness of RMI institutions responsible for drought early warning and preparedness, by strengthening institutional coordination and accountability mechanisms between government departments to initiate drought preparedness and coordinate response. This output will prepare a system and technology roadmap for outer island communications, and upgrade communications systems in remote locations and train people to use them. The project will also support local governments and Community-based Water Committees to mobilize resources and to develop and implement contingency plans in anticipation of and in response to droughts.

Activity 3.1. Update national-level contingency plans and Standard Operating Procedures (SOPs) for climate change induced drought response

137. This activity will support the Office of Chief Secretary (OCS), National Disaster Management Office (NDMO), Municipal Governments, Weather Service Office, Ministry of Finance, Environmental Protection Authority, Ministry of Internal Affairs, Community and Nongovernmental Organizations and development partners, and private sector to develop systems to coordinate early warning and disaster response.

138. The Project will strengthen the capacity of NDMO housed within OCS, to implement its mandate to lead coordination efforts for drought preparedness and response. This activity will also support the NDMO to expand their subnational disaster management and coordination efforts through the appointment of community disaster focal points within the existing Mayoral committees and disaster management plan development. NDMO will play an active role in the Community-based Water Committee establishment and Water Safety Plan development and implementation process.

139. The project will also support the development of SOPs for drought early warning and response. The EPA and the CSO will be responsible for the SOPs in coordination with the NDMO. The SOPs will indicate in a comprehensive manner, the specific actions required to be taken by various Ministries and Departments of the RMI Government in responding to droughts within the context of their overall disaster management strategies and JNAP. The private sector will be engaged in the development of the SOPs so that their skills and resources can be capitalised upon. The SOPs will provide, in a concise and convenient form, a list of major executive actions involved in responding to drought and necessary measures for preparedness, response and relief required to be taken.

140. Training programs for drought risk management and contingency planning at institutional level will be provided to improve the entire cycle of activities required to develop plans that are practical, result-oriented, simple, participatory, realistic and supported by preparedness actions. It will ensure that NDMO and partners are prepared to respond to anticipated droughts and have the systems and tools to respond in a timely manner during drought. This training will target functional level staff of the NDMO, other government departments, volunteers, NGOs the UN, intergovernmental bodies and the private sector.

141. The training will aid participants in the understanding of the need for contingency planning, how to develop plans, quality and accountability, resource mobilization, vulnerability and capacity assessment, risk analysis and how to activate the plan. The training will also enable the participants to update and evaluate the drought contingency plan once implemented.

142. The proposed activity will furthermore invest in technical assistance, and will facilitate workshops to update RMI drought contingency plans and develop SOPs within the overall context of national disaster preparedness so that drought plans are mainstreamed into national emergency processes. This will include the development of drought scenarios, technical audit and improvement of the internal management structure, human resources, assessment, logistics, communications, resource mobilization and mobilization of media and information channels. The SOPs for droughts will be developed and tested through training and simulation. Budgets will be allocated, and a monitoring and evaluation process will be set up. Moreover, this activity will update the national-level water safety plans for effective risk management for improvements in documenting and monitoring climate change triggers, in addition to defining better mechanisms for more efficient and timely communication of issues that trigger national or atoll level actions to support vulnerable communities level. (Annex IIa, Sections 11.3 and 11.4).

Activity 3.2. Develop and implement community-level drought contingency planning in outer islands and atolls

143. Community-based Water Committees (CWCs) will be developed in the 77 communities and will be organized on an atoll basis building on ongoing community-based natural resource planning initiatives. With stakeholder involvement and coordination with community leaders and designated representatives of CWCs, the proposed activity will provide training and formulate SOPs to develop and implement drought contingency plans when a drought warning is issued. These contingency plans will define goals and objectives, such as targets for reduced consumption, priority of use (especially in the case of WASH) etc based on an assessment of all existing and potential water supply sources during episodes of extreme drought. The project will also train and provide required technology to develop and implement these plans using the management strategies, templates, and statistics assembled during the assessment process. Considering that the length, severity and frequency of drought conditions are projected to increase by 2045, the GCF co-financing of this activity is justified.

144. The water harvested at the community level will be communal by definition. Therefore, to ensure the sustainable management, operation and maintenance of the harvesting and storage systems and the equitable distribution of the water resource, the project will provide training to CWCs to conduct simple water balance assessments and access plans for community water resources defining rights of access and exclusion. Considering that in most cases

communally harvested water will be most critical during extreme drought events, the investment of GCF funds meet the climate additionality requirements.

145. CWCs will play a critical role in the planning, coordination, implementation, and monitoring of the proposed community-based water security and water resilience initiatives. The project will strengthen 77 Community-based Water Committees (CWCs) and enhance their capacities to develop, implement, operate, monitor, and maintain drought SOPs - the governing framework for the water investments, in line with the National Water and Sanitation Policy. The CWCs will represent the area population and include women and men landowners, water users, traditional leaders, local government, and national authorities.

146. The CWCs will build on existing structures that may exist in some of the communities, such as the disaster management committees and Reimaanlok's natural resource management committees. Traditional leaders will be engaged and involved, and play a significant role in providing the leadership, support, and credibility to the CWCs. In the context of the project, these community-based organizations will have two significant tasks:

a. The operation and maintenance (with government support and oversight) of community-based investments made by the project. This will include community water storage and community wells.

b. The equitable and sustainable distribution of water during droughts, understanding of more vulnerable community member needs and WASH requirements.

147. The project will provide technical assistance to the CWCs and to local governments to develop adaptive drought contingency plans to be pilot tested during the project implementation period. The technical assistance will be in the context of local and international facilitators with best-practice examples from the region and elsewhere. The Standard Operating Procedures (SOPs) will be used by municipal government, community organizations and households (i.e. schools, churches, etc). The SOPs will entail good practice guidelines for the operation, management, and monitoring of all water security investments (household and community rainwater harvesting systems improvements). These guidelines will also take into consideration gender and social inclusion as well as environmental and social safeguard principles.

C.4. Background Information on Project / Programme Sponsor (Executing Entity)

148. The United Nations Development Program will execute this GCF project as per a request made by the Government of the Republic of the Marshall Islands. A similar direct implementation modality by UNDP was requested by the GoRMI for a $3.93 million GEF-funded project launched in February 2018. UNDP has extensive experience as the Executing Entity of climate change adaptation projects globally.

149. UNDP's experience in supporting Pacific SIDs has also been significant, and growing, delivering an average of approximately USD30 million per annum across 15 Pacific SIDs through 4 offices. In partnership with national governments, UNDP support hard and soft investments at all levels, from communities to local and national government and regional entities in order to strengthen inclusive growth, better services, environmental sustainability, good governance, and security that are fundamental to building resilience and sustaining development results. As a Global Environment Fund (GEF) agency and Adaptation Fund (AF) Multilateral Implementing Entity (MIE), UNDP has completed and ongoing initiatives related to enhancing climate change and disaster risk resilience in food, water, and energy sectors.

150. In RMI, UNDP has a long history of successful partnerships with the Government in the area of governance strengthening, climate change, renewable energy, gender, and environmental/natural resource management, integrated water resource management, at both national and international levels. At the regional level UNDP is also supporting RMI through regional projects, which are listed in the Feasibility Study. Foremost is the abovementioned $3.93 million GEF-funded project "Reimaanlok – Looking to the Future: Strengthening natural resource management in atoll communities in the Republic of Marshall Islands employing integrated approaches (RMI R2R)", which would synergize with this GCF-proposed project in 5 atolls. Other projects include, but are not limited to, successful joint efforts in: Second National Communication (SNC), National Biodiversity Strategies and Action Plans (NBSAPs), mainstreaming of environmental sustainability and sustainable development goals into national policies, planning frameworks and programs, and local governance strengthening. In addition, UNDP, in collaboration with GEF Small Grants Programme (SGP), have been tackling community-based initiatives on sustainable farming, youth and women empowerment, waste management, environmental conservation, water resilience, and renewable energy.

C.5. Market Overview (if applicable)

Not applicable

C.6. Regulation, Taxation and Insurance (if applicable)

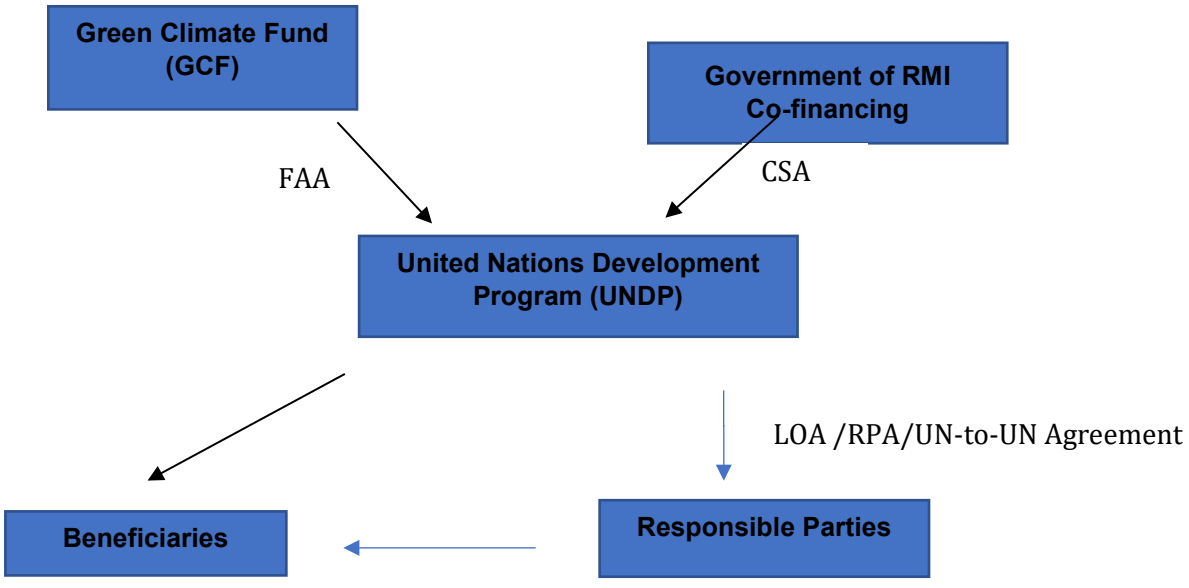
151. No government licenses or permits will be required for Outputs 1 and 2 as both outputs will only result in increasing of water harvesting and storage capacity at the household and community level. At the community level the proposed project will assist local governments install RWH systems in public building. These local government entities will obtain any licenses or permits required. Although unlikely, the EPA will advise if any impact assessments are required once designs have been finalised.

152. For any activities related to procurement of services through UNDP, taxes are not applicable in accordance with the Standard Basic Assistance Agreement signed with RMI of the Convention on the Privileges and Immunities of the United Nations provides inter alia that the United Nations and its subsidiary agencies are exempt from all direct taxes (except charges for utilities services) as well as from customs duties and charges of a similar nature in respect of articles imported or exported for official use. If the services are procured directly by RMI implementing partners, then national and state legislation will apply, including payment of taxes such as VAT according to the national or state rates, as applicable.

C.7. Institutional / Implementation Arrangements

153. At the request from the Government of RMI and the GCF National Designated Authority, and taking into account the procurement burdens entailed by what this project seeks to do, the project will be implemented as per UNDP's Direct Implementation Modality (DIM). The official request from the Government is included in Annex XIIIh. UNDP will manage the grant co-financing from GoRMI through a Cost Sharing Agreement (CSA). This will be blended with the GCF grant during implementation.

154. The GCF grant will be managed directly by UNDP through the Direct Implementation Modality arrangement. The co-financing from RMI will also be managed by UNDP through a Cost-Sharing Agreement. The contractual arrangements and funds flow (Fig. C7.1) will ensure seamless implementation of the project with respect to procurement, transport and installation of rainwater harvesting and storage systems that will simultaneously meet water requirements for baseline and climate-induced droughts. Part of the funds may be coursed through responsible parties using the appropriate instrument: Letters of Agreement for government entities; Responsible Party Agreement for non-government organizations; UN-to-UN Agreement for IOM. Activities that will benefit the communities may also be implemented directly by UNDP through the PMU.



155. A Project Management Unit (PMU), comprised of a group of project-financed staff, located in Majuro, will be responsible for the execution of the proposed activities, in collaboration with other responsible parties such as the RMI Environmental Protection Agency, (EPA) the Office of the Chief Secretary (OCS) and other government agencies, international agencies (e.g., International Organization for Migration – IOM) and non-government partners. The PMU,

under contract by UNDP, will be responsible for day to day activities outlined in this project document. The work of the PMU will be overseen by UNDP. Costs related to Project Execution (e.g. the costs of project management staff for the duration of the project; costs for project inception, Steering Committee and other stakeholder meetings; costs of independent external evaluations; and costs for monitoring/evaluation-related travel of project staff to the field sites) have been costed and budgeted in the Project Management Costs.

156. Under the DIM arrangement, UNDP assumes the responsibility for mobilizing and applying effectively the required inputs to achieve the expected outputs. UNDP assumes overall management responsibility and accountability for project implementation. Accordingly, the PMU is subject to UNDP policies and procedures.

157. At the same time, as Accredited Entity to GCF, UNDP provides a three – tier oversight and quality assurance role involving UNDP staff in Country Offices and at regional and headquarters levels. The quality assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. Project Assurance must be independent of the Project Management function; the Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager or other members of the PMU. The project assurance role is covered by the accredited entity fee provided by the GCF. As an Accredited Entity to the GCF, UNDP is required to deliver GCF-specific oversight and quality assurance services including: (i) Day-to-day oversight supervision, (ii) Oversight of project completion, (iii) Oversight of project reporting. UNDP contracted personnel involved in project execution will not perform oversight functions. Throughout the lifetime of the project, the project assurance and execution roles of UNDP will be strictly separated.

158. The proposed high level organizational structure along with a description of each key role is provided below:

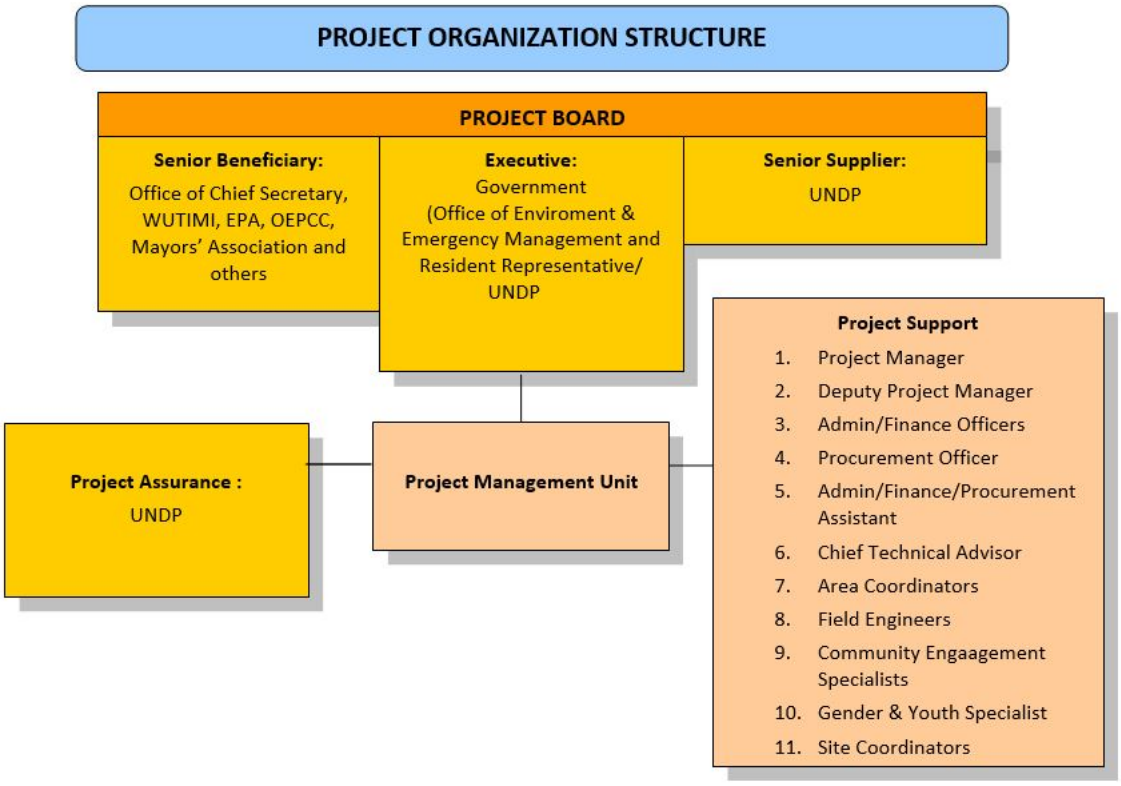


Figure C7.1 Project organization structure

159. The project will be guided by a Project Board (PB) and implementation will be via the PMU. The Project Board will be the highest decision-making and coordination body for the project and will have bi-annual regular meetings. It will be responsible for making, by consensus, management decisions when guidance is required by the PMU. Project Board decisions will be made in accordance with standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition.

160. The Project Board will be co-chaired by UNDP Country Director or his/her designated representative and the Chief Secretary from OCS. Furthermore, representatives the Office of Environmental Policy and Planning Coordination (NDA of GCF), Environmental Protection Authority (EPA), Women's United Together Marshall Islands (WUTMI), the association of Mayors and others will also be members of the PB.

161. UNDP also participates in the PB as 'senior supplier' to represent the interests of the parties which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The senior supplier's primary function within the Board is to provide guidance regarding the policies and procedures that govern the implementation of project activities as per UNDP and GCF standards (as outlined in the AMA and FAA that will be entered into following a Board decision on this project). The senior supplier role will have the authority to commit or acquire supplier resources required.

162. The PMU, headed by a Project Manager will be set up to manage day-to-day financial disbursement and project implementation. The Project Manager will implement the project, under guidance of the PB and day-to-day supervision by UNDP and OCS within the constraints laid down by the PB and as per the Annual Work Plan approved by the PB and reviewed by UNDP. The PM's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The Project Manager will have a matrix reporting arrangement to the UNDP Pacific Office and the RMI Office of Chief Secretary.

163. The PMU will comprise a group of project-financed staff. The PMU will be located in Majuro with several key staff members located in the UNDP Pacific Office in Fiji due to logistical requirements. The PMU will be responsible for supporting the Project Manager in carrying out day-to-day activities of the project, the overall operational and financial management, and liaison with relevant stakeholders for the project. The PMU comprises of the following positions:

Majuro- and field-based

- Project Manager: Responsible for the oversight of direct project activities and deliverables, reporting and financial oversight, as well as staff management and coordination of project goals
- Finance and Admin Officer: Responsible for the financial management of the project including the overall budget expenditures according to the Project Document, advising the Government, PMU and UNDP on the need for budget revision and/or off-track activities, and presenting financial analysis at Project Board meetings.
- Procurement Officer: Oversee every procurement that takes place in the project including individual and institutional contracts.
- Admin/Finance/Procurement Assistant: Provides backstopping support to the two officers.
- Area Coordinators (2): Oversee the implementations of project activities in the communities by working closely with the field engineers and the site coordinators.
- Field Engineers (2): Responsible for the design and roll-out and technical support for operations and maintenance of household and community rainwater harvesting systems and related interventions.
- Community Engagement Specialists (2): Provide assistance to site coordinators in engaging communities and securing support for project activities.
- Gender and Youth Specialist: Ensure that gender and youth concerns are fully addressed by the project by working closely with all project staff and with communities as needed.
- Site Coordinators (70): Community-based staff working directly with communities in the implementation of project activities.

Suva based Project Staff

- Deputy Project Manager: Responsible for assisting the PM in every aspect of project management but will specifically be responsible for liaison with UNDP Pacific Office and key stakeholders in the project.
- Finance and Admin Officer: Responsible for setting up and maintaining the project accounting system, monitor quarterly and activity-wise expenditures vis-à-vis Annual Work Plan, prepare budget revision, process payment requests, update financial plans, and prepare status reports and other financial reports.

Consultants

- Chief Technical Advisor: Responsible for bringing in international best practices to the implementation of the project and train the technical personnel in the PMU. The CTA will be an international staff under UNDP contract. CTA will be hired for the duration of the project on a part-time basis. The CTA will be based in in Majuro.

- Short-term consultants will be hired to support the PMU.

Responsible Parties

164. During implementation, UNDP will assess the engagement of project partners, including government departments such as EPA and OCS, the International Organization for Migration (IOM) for provision of specific services consistent with the Direct Implementation Modality. IOM has a sub-regional office in Pohnpei and a sub-office in Majuro that have been implementing projects on water in RMI, FSM and other Pacific SIDS.

Operational arrangements

165. Annex II- Feasibility Study has documented acceptance of an operations and maintenance (O&M) system: Tier 1: Beneficiary households and Community Building Owners/Management Tier 2: Community Water Committees (CWC) or equivalent representative Tier 3: Mayors and Community Leaders (Chiefs) – Mayor Council Tier 4: OCS and NDMO/ National Government. Refer Section D2 – Exit Strategy and Annex II – Feasibility Study (Sections 8.5 and 12) for further details.

C.8. Timetable of Project/Programme Implementation

166. Below is a summary of the project implementation schedule. A more detailed schedule showing milestones in Annex X.

TASK	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6				YEAR 7			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Output 1. Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI																												
Activity 1.1. Improve existing rainwater harvesting systems for community buildings and households in outer islands and atolls for usage during increasing frequency and periods of drought			x	x	x	x	x	x	x	x	x	x	x	x	x	x												
Activity 1.2. Provide additional rainwater harvesting systems and increase of storage capacity for communities in outer islands and atolls for usage during increasing frequency and periods of drought			x	x	x	x	x	x	x	x	x	x	x	x	x	x												
Output 2. Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall																												
Activity 2.1. Protect groundwater wells from more frequent climate change induced storm surges and contaminations					x	x	x	x	x	x	x	x	x	x	x	x												

Activity 2.2. Enhance women and youth's leadership through best practices and community awareness programmes on efficient usage (demand management) of rainwater r			x	x	x	x	x		x	x	x		x	x	x		x	x	x		x	x	x	x				
Output 3 Climate change induced drought preparedness and response measures implemented in outer atolls and islands																												
Activity 3.1. . Update national-level contingency plans and Standard Operating Procedures (SOPs) for climate change induced drought response			x	x					x	x	x	x		x	x				x	x			x	x	x			
Activity 3.2. Develop and implement community-level drought contingency planning in outer islands and atolls			x						x	x	x	x		x	x				x	x			x	x	x			
Project Management	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

D.1. Value Added for GCF Involvement

167. GCF would be financing the additional costs of adaptation that occur as a result of climate change. As indicated in section C1, climate projections indicate that both drought frequency and duration are likely to increase in the future due to climate change. Therefore, RMI is required to increase investments in both drought preparedness and drought response. Considering that the most significant impact of drought is the scarcity of potable water in the islands and atolls during the latter stages of prolonged drought, additional investments are required to increase the capacity for rainwater harvesting and storage at both the household and community levels. Likewise, RMI is required to make considerable investments in contingent planning and preparedness for longer droughts that are likely to be more frequent.

168. The Marshall Islands is among the 10 smallest states in the world, and it struggles with the challenges of a dispersed population and a remote location far from potential markets for the country's goods and services. RMI's economy is highly dependent on external aid, as the base for private sector growth is limited by its small size, remoteness, and dispersion over a vast ocean area. The ADB indicates that the country's economy, after a drought induced contraction in 2014/15, has only had GDP growth of 1.9% in 2016, and a forecast GDP growth of 4% and 2.5% for 2017 and 2018 respectively[30]. However, the RMI PDNA[31] estimates that the impact of the drought was even more significant and potentially reduced GDP growth to as low as 1%. Based on the PDNA the total cost of emergency response and recovery to the extreme drought experienced during the period was estimated at USD 3 million, with 1.3 million needed for recovery efforts in 2016, and the remaining 1.7 million needed for implementation of activities in FY 2017 and FY 2018. The estimated economic impact of the drought for the 2016 financial year was approximately USD 4.9 million, comprising USD 4 million in disruptions of national production flows and USD 882,400 in higher costs of production, and USD 9,100 worth of livestock.[32] The disruptions in production include USD 2.9 million in gross production losses in the agriculture, education and industrial sectors, as well as gross production increases worth USD 1.1 million in electricity, water and sanitation, and commerce. The higher production costs include higher commercial sales – such as bottled water and higher transport costs. These economic effects are equivalent to 3.4% of RMI's gross domestic product (GDP) for FY 2015.[33]

169. Current government income is heavily dependent on the Compact of Free Association Agreement between the United States and the RMI which specifies direct grants from the US government to RMI for a number of sectors including education, health, private and public-sector development and environment. However, grants related to the agreement are scheduled to expire in 2023 as per the agreement signed in 2003 after which RMI is required to rely on other sources including returns of a Compact Trust Fund established in the context of the Agreement. Multiple assessment of the Compact Trust Fund indicate that the returns are unlikely to be adequate to replace current payments under the Compact.[34,35] Considering these factors, the IMF estimates that the RMI fiscal balance is likely to deteriorate to a sizable deficit in the medium term.

170. Under these constraints, the RMI is faced with significant climate change adaptation expenditures. Apart from drought, RMI is exposed to a variety of other disaster risks, including coastal hazards (e.g. wave-induced erosion and flooding linked to king tides and storm surge) and tropical storms. RMI is not in a seismically active area, however the tectonic boundaries of the Pacific plate are extremely active seismic zones and can generate earthquakes and tsunamis capable of travelling great distances. The Pacific Catastrophe Risk Assessment and Financing Initiative[36] in 2011 estimated the average annual loss related to cyclones and tsunami/earthquake, to be around 1.7 % of GDP (i.e. USD 3 million per year) and estimated that in the next 50 years, RMI has a 50% chance of experiencing a loss exceeding USD53 million and a 10% chance of experiencing a loss exceeding USD 160 million[37].

171. Therefore, RMI has limited financial capacity to fund this range of critical climate related additional investments while also absorbing replacement costs due to damages and response costs during disasters. Like most vulnerable SIDS, RMI requires all available resources to invest in climate change adaptation. As indicated earlier, a number of development partners are already financing investments in a number of other sectors. Therefore, GCF resources are critical for the water sector in this context.

[30] https://www.adb.org/countries/marshall-islands/economy
[31] RMI (2017) Post Disaster Needs Assessment of the 2015-2016 Drought
[32] ibid

D.2. Exit Strategy

172. The proposed project has been designed in close consultation with and involvement of relevant government agencies and technical line departments, international agencies such as IOM and Red Cross, local NGOs, private sector, and community CBOs on the target atolls. These consultations and discussions (detailed in Annex XIIId-1), combined with tried and tested models for improved and resilient water management that are detailed in the Feasibility Study (Annex II) provide the project with a sound approach and a set of interventions that meet adaptation priorities and intervention needs that will be implemented with strong community participation and engagement of local officials. Building on this foundation, the project ensures that the investments, as well as the results of the interventions, are sustained beyond the project period and in the longer-term through the following elements of project design and implementation.

173. Approximately 66% of the proposed project investment will be to install and upgrade rooftop rainwater harvesting mechanisms and to increase water storage capacity at the household and community levels. The household investments will be operated and maintained over the lifetime of the components by the private household as it is their private interest to do so. The lifetime of the components used to upgrade or install rooftop water catchment units are 10 years and the lifetime of the water storage tanks are 25 years and 20 years for tank linings as per the manufacturers' specifications certified by independent assessments (see Annex II - Feasibility Study).

174. Agreement on the mechanism for Operation and Maintenance has been documented in Annex XIIIb. The plan reflects local ownership and commitment for the long-term sustainability of the project activities and outcomes.

175. The community systems will be operated and maintained by the local government authorities through the CWCs, with a financial allocation from the RMI government. Letters of financial commitment from the RMI government for the project period and post project until 2045 are in Annex IV. The type of investments proposed are not technically complex, therefore the materials required for O&M will be readily available.

176. To ensure the sustainable management of the harvesting and storage systems and the equitable distribution, operation and maintenance of the water resource, the project will provide training to CWCs to conduct simple water balance assessments and access plans for community water resources. Women and youth will particularly be targeted for training. Female trainers will be trained and empowered to ensure that women's specific vulnerabilities to climate change and water management are addressed.

177. The project will invest in strengthening capacity and existing institutions in charge of early warning, preparedness and response to hydro-meteorological hazards (e.g. National Disaster Management Office). Technical operations staff will be trained to communicate and disseminate drought forecasts and mobilize government departments and ministries in disaster response. The SOPs developed at both national level and at the community level can be further developed and adaptively managed by the beneficiaries.

178. Developing simple and affordable technologies based on the needs of RMI offers a cost-effective solution to the problem. This is the core to the project strategy. Rainwater harvesting is a viable solution to meet water supply targets inexpensively. Thus, it is prioritized by the project to make households water self-sufficient.

[33] ibid
[34] http://www.imf.org/en/News/Articles/2015/09/28/04/52/mcs100711#top
[35] http://pacificpolicy.org/2013/12/compact-2024-whats-ahead-for-marshall-islands-and-fsm/
[36] http://pcrafi.spc.int/
[37] http://documents.worldbank.org/curated/pt/598091467993177149/pdf/96746-BRI-Box391446B-PUBLIC-MarshallIslands.pdf

E.1. Impact Potential

Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas

E.1.1. Mitigation / adaptation impact potential

179. The GCF paradigm shift objective that this project would contribute to is "A2.0 Increased resilience of health and well-being, and food and water security". There will be approximately 15,572 (2017) direct beneficiaries (28% of the population of RMI) (of which 49% are female) and the entire nation will be indirectly benefit; approximately 55,226 (2017) indirect beneficiaries (of which 49% are female. This will be achieved through improved water security to the communities of the outer atolls and islands.

180. The projects potential in terms of economic, environmental, technical and gender/social inclusion impacts are outlined below:

Economic impact Potential

181. The proposed solutions have low operation and maintenance costs compared to other possible solutions eg desalination would require provision of power and considerably more maintenance. Economic assessment determined that the proposed interventions are cost-effective (refer Annex XII). Economic benefits include avoided costs associated with options such as desalination (eg O&M costs), avoided disaster response costs and improved productivity due to some of the reasons given below eg reduced time collecting water, ability to continue with some economic activities eg production of handicrafts, reduction in migration etc. With approximately 20% of RMI population reported to be living on less than USD 1 a day, financially sustainable solutions, such as those provided by this project, are critical to achieving the GCF objective A7.0 Strengthened adaptive capacity and reduced exposure to climate risks.

182. The RMI government has committed to allocate funds to cover periodic operating and maintenance costs beyond the life of the project (refer Annex IV), further enhancing the long-term impact of this project.

Environmental impact potential

183. As noted above, RWH and storage solutions do not require significant ongoing energy inputs, and therefore provide a solution that allows adaptation to climate change without need for increased power supply (which on RMI typically requires burning of fossil fuels). Furthermore, the solutions proposed in this project have low maintance requirements in terms of consumables and replacement parts thereby reducing environmental impacts associated with both manufacture and transportation.

184. The protection of 2,586 wells will reduce contamination of groundwater, benefiting both people and island flora and fauna that utilise groundwater. Environmental sustainability will be enhanced nationally through improved management of water resources, which will be achieved through capacity building government and community institutions.

Technical impact potential

185. The proposed RWH technologies are far from complex. Nevertheless, the project includes technical training for Water Management Committees and government water managers. Training activities will include: skills building for installation, operation, monitoring of RWH systems; groundwater testing training; climate awareness; disaster Standard Operating Procedures (SOP) development; gender awareness, menstrual hygiene management etc. Female trainers will be trained and empowered to ensure that women's specific vulnerabilities to climate change and water management are addressed. Seventy seven communities across 24 atolls will directly benefit, and the strengthened governance will indirectly benefit the entire nation.

186. The proposed infrastructure has life cycles of up to 25 years to last until 2045 and can be operated and maintained with minimal technical skills. The project funding covers O&M costs and sustenance capital up to this period.

Gender/social inclusion impact potential

187. The project is based on a participatory approach –both government and community involvement will be key to the project success and will build buy-in and ownership of solutions. Water security may be measured as the increase in months where households have rainwater available to them for consumption. Islands in targeted atolls will be

more resilient in terms of water security during the prolonged droughts that expected to result from climate change impacts.

188. The engineered tanks that will be sourced by the project will include all the appurtenances to ensure ease of operations and maintenance assuring optimal water quality. This will include screens to exclude insect vectors and aprons/drainage to prevent ponding, which should help reduce vector borne diseases. Improved water supply will provide safe drinking water year-round, reduce migration during droughts, improve productivity due to reduction in time lost while collecting water, reduce social tensions caused by severe water shortages, help reduce the incidence of water-stress related diseases (which have been noted to increase during droughts).

189. Negative impacts on education are reduced as schools will have water, absenteeism due to sickness will be reduced and children will spend less time collecting water. Women will have greater involvement in the management of water resources and will also spend less time collecting water during droughts.

190. Equitable distribution of water supply during drought to meet WASH requirements will be practiced and water conservation measures awareness training shall be provided.

191. The project will provide for women's direct engagement in a community decision-making process through their inclusion on Community-based Water Committees to ensure they have a formal, public role in water management. Over time, this could lead to women's increased engagement in broader political processes at community and island level.

E.1.2. Key impact potential indicator

GCF core indicators	*Expected tonnes of carbon dioxide equivalent (t CO_2 eq) to be reduced or avoided (Mitigation only)*	*Annual*	Not applicable
		Lifetime	Not applicable
	• *Expected total number of direct and indirect beneficiaries, disaggregated by gender (reduced vulnerability or increased resilience);* • *Number of beneficiaries relative to total population, disaggregated by gender (adaptation only)*	*Total*	Approximately 15,572 (2017) direct beneficiaries (28% of the population of RMI) (of which 49% are female) Approximately 55,226 (2017) indirect beneficiaries (of which 49% are female)
		Percentage (%)	100% - Direct and indirect beneficiaries represent the total population of RMI
Other relevant indicators	• Access to safe freshwater year-round • Number of groundwater wells protected • Reduction in water-related health impacts • Number of Community-Based Water Committees • SOPs developed • Number of people with strengthened capacity		

192. All rural[38] communities across the 24 inhabited local government jurisdictions with 5 or more households (approximately 30 people or more people) were considered as target communities for the proposed interventions. On this basis, 77 communities are being targeted. Populations were estimated using census data and national population estimates available in 5 year intervals for 2011-2045[39] (refer Annex II Feasibility Study Annex 2).

[38] Rural communities include: Communities of Majuro Atoll that are located outside the service area of MWSC; communities of Kwajalein Atoll that are located outside the service area of KAJUR; and communities located in the local government jurisdictions of the other 22 outer islands and atolls.

[39] 2016 SPC Pacific Island Populations. Estimates and projections of demographic indicators for selected years. (PRISM)

193. The total number of indirect beneficiaries include all the households of RMI as capacity building will result in improved water resource management and improved disaster preparedness (particularly to droughts) nationally.

Comparison of project indicator values with similar projects

194. One project that is similar, in a comparable context, is the IOM "Rainwater Harvesting Improvement Project" supported by the New Zealand Government. This project aimed to pilot the improvement of rainwater harvesting systems at the household level in the outer islands of RMI. A total of 68 households were targetted for improvements and the project achieved to benefit 94% of the target beneficiaries during implementation.

195. Another similar project was the GIZ-funded "Improving Water Supply Resilience for the Outer Islands High School in the Republic of Marshall Islands". The project had the following objective: To contribute to Goals 3 and 5 of the JNAP and to WASH cluster objective 3 of the RMI Drought Response Plan, measurable against the following outcomes: 1) increased supply of potable for students, staff and neighbouring communities of Kwajalein Atoll High School (KAHS) and Northern Islands High School (NIHS) during times of drought and low rainfall by July 2018; and 2) improved management of water resources at KAHS and NIHS by July 2018

196. Parallels can also be drawn between the approved GCF Maldives project: "Supporting vulnerable communities in Maldives to manage climate change-induced water shortages", which includes activities related to rainwater harvesting and integrated water management on low-lying atolls and islands. The set of indicators for this project is in fact similar to the proposed Maldives GCF project, which is an indication that SIDS in the Pacific region are facing similar set of constraints/barriers.

E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project/programme investment

197. There are a number of past and existing initiatives underway in RMI to address water security and resilience, however many have been one-off efforts financed through time-bound projects, often initiated through drought response rather than strategically placing investments to avoid or mitigate droughts and/or holistically strengthen and improve the freshwater resource systems on which communities rely. Further, previous initiatives have often lacked sufficient capacity building elements for government and communities, or the legislative framework within which to focus efforts. This project adopts a holistic approach to the integration of actions at various levels of community, local and national institutional to implement sustainable infrastructure aligns with the new National Environmental Protection Act and the National Water and Sanitation Policy.

198. The proposed project supports the Government of RMI in adapting to increasing climate risks, particularly droughts which are becoming more frequent and extreme, which impact the country's drinking water supply. The climate modeling distinguished between non-climate-induced (baseline) drought and climate-induced droughts which formed the basis for climate additionality. The project will both meet the water supply gap for both types of drought with the baseline drought requirements fully financed by government and the gap due to climate change will be supported by GCF. The investments from both government and GCF will be implemented simultaneously.

199. The project considered five sources of water - rainwater harvested by households, rainwater harvested by communities/municipalities, groundwater accessed through wells, desalinated seawater and demand management – to determine the optimal and cost-effective portfolio of sources to be developed by the proposed project. This analysis used a marginal unit cost of water approach and determined the mix of investments to meet the water security objectives during droughts (Figure E2.1). This economic assessment of potential supply side and demand-side solutions informed the investments proposed by the project.

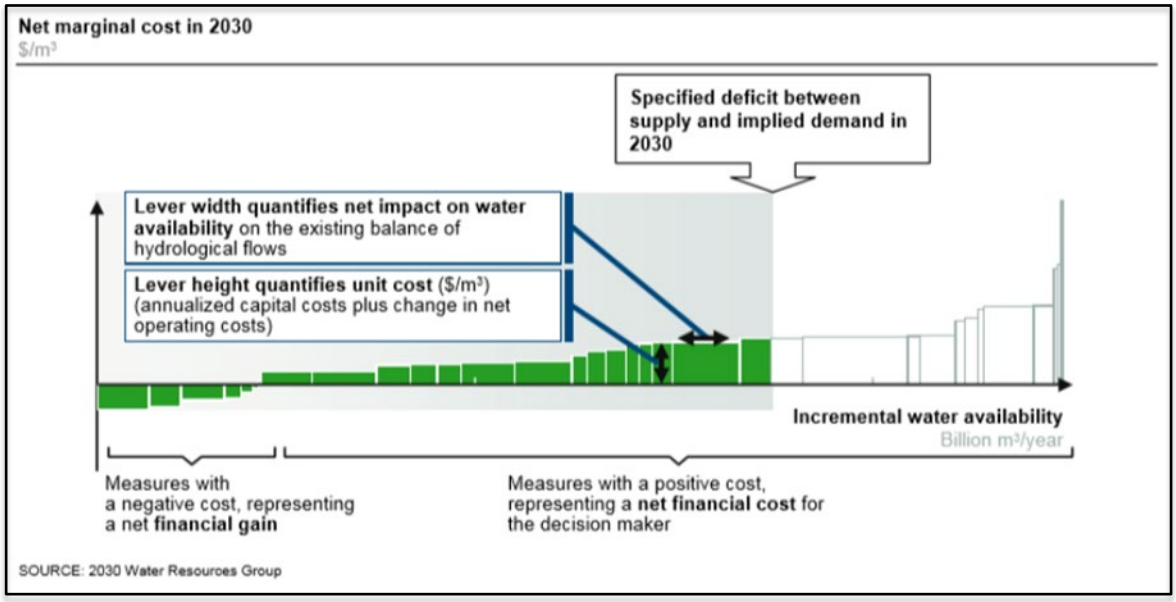


Figure E2.1. Example of cost curve methodology

200. The optimisation of existing and addition of new water harvesting infrastructure and the expansion of water storage capacity sufficient to provide communities with a minimum of 20L per day per person during droughts and practically throughout the year is a paradigm shift as it will make communities self-reliant in terms of water supply. Operation and maintenance of the enhanced systems will be in the control of the households and the communities that will directly benefit, who in turn will be supported by the national Water Office newly established under the EPA.

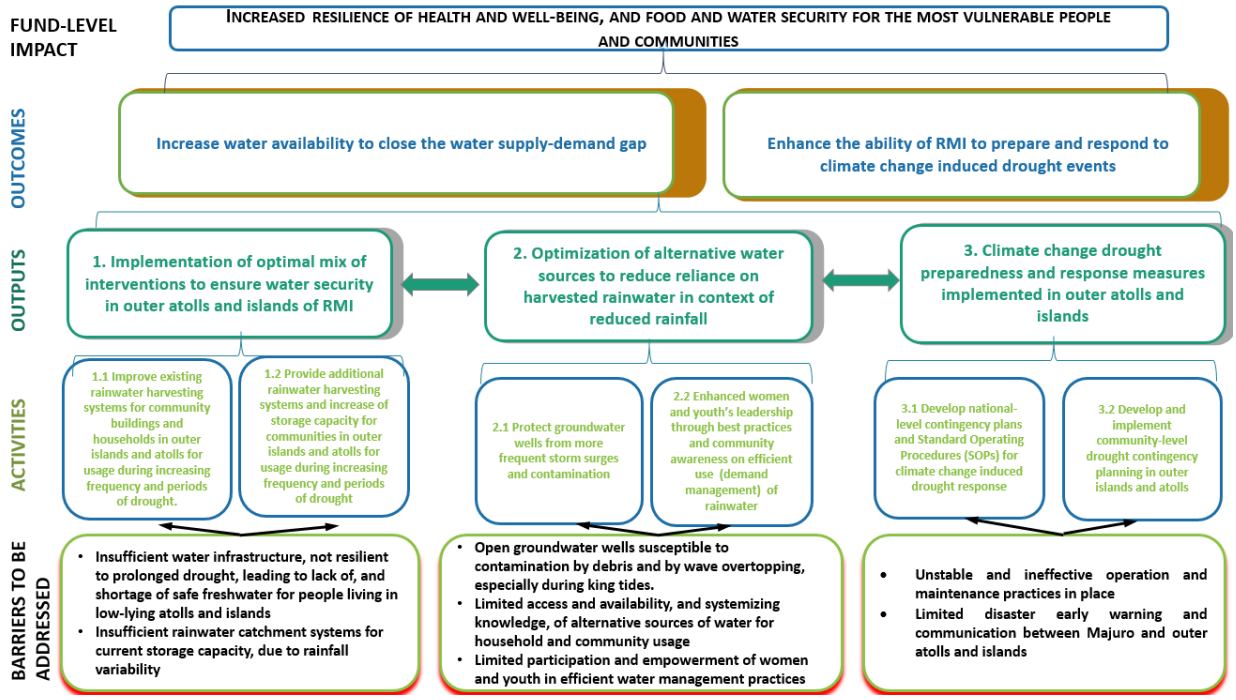


Figure E2.2 Theory of Change

201. The establishment of a national Water Office, supported by community water committees, to manage water resources is an institutional paradigm shift for RMI. This will provide integrated water management thoughout RMI. This in turn will enable RMI to be better prepared for disasters as a coordinated approach to water management, and in particular the reporting of stored water volumes, when coupled with forecasts will enable water managers to preempt likely shortages and assist the government to mobilise emergency resources to where they are most likely to be required.

202. The increased protection of groundwater is a paradigm shift as groundwater has been shown to be a critical secondary water source and at present wells are unprotected and presently represent a means for contamination from climate change events (e.g. storm surge and king tides) to impact groundwater resources.

203. The theory of change articulated below illustrates how each of the three outputs of the proposed project contribute to the long-term objective and how the resulting project impacts can be sustained to contribute to climate-resilience in RMI. Through integration of the specific elements described in the Exit Strategy into the project design and implementation, conditions are created that lead to sustained impacts and potential for scale up of the initial impact.

204. The Theory of Change for the proposed project is shown in the diagram below (Figure E2.2). It illustrates how the development of project outputs will lead to an outcome of strengthened capacity of the RMI government and communities to manage the water security impacts of climate change-induced droughts communities in the outer atolls and. In the longer-term, the outputs will lead to a fund level impact of a reduction of climate change related disaster risks for the region through enabling a new integrated water management paradigm that involves both communities and government institutions to better manage drought risks on RMI.

205. Provisions have been made, through the Gender Analysis and Action Plan (Annex XIIIc), to ensure that gender mainstreaming approaches are applied throughout the project.

E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

206. The project will address the water needs of all rural[40] communities across the 24 inhabited local government jurisdictions with 5 or more households and is national in its scope, therefore further scaling up and replication of the physical interventions within RMI is limited. However the approach taken ie rigorous technical, financial, environmental/social analysis, including climate modelling, can be applied to other sectors within RMI. Further, the physical interventions, being technically simple and cost effective, have considerable scope for application in other SIDS globally.

207. The proposed project, through rigorous engineering, financial and economic analyses, shows rainwater harvesting and storage to be the most viable and cost-effective option to meet the drought water security needs of RMI atolls and islands. This assessment methodology as well as the potential to use rainwater as a primary source of water can be replicated in a number of contexts across the world where climate change induced droughts impact on the availability of potable water and where options are limited due to constraints similar to those in the RMI.

208. Whereas in many contexts considerably expensive solutions are promoted for climate change adaptation in general and for water supply in particular, this project will show that technologically simple, low cost and accessible technologies such as rainwater harvesting if well planned and implemented comprehensively, can solve intractable water scarcity related to climate change.

209. Furthermore, the proposed project demonstrates that hardware development needs to be complimented by soft approaches such as capacity strengthening. The development of RWH systems and the rehabilitation of groundwater wells can only be successful if the community is able to prepare for droughts by concomitantly reducing the consumption of water and using the available water rationally and equitably.

E.2.2. Potential for knowledge and learning

210. Implementation of concrete adaptation actions on the ground will constitute the primary learning experience, which will feed into all awareness, training and knowledge management actions facilitated and conducted by the project. More specifically the project will design and deliver training programmes in water management, planning and budgeting, expenditure management and performance monitoring for relevant atoll and island councils and the Government of RMI.

211. The development and training of CWCs will provide opportunities for knowledge sharing within and between island communities. Women and youth will be targeted for training and engagement in CWCs. The CWCs will be instrumental in not only the operation and maintenance of the RWH systems and protected groundwater wells, but also in the broader education of communities to better manage water resources. Many of the skills that will be developed by the CWCs will be transferable to other sectors.

212. This project will show that technologically simple, low cost and accessible technologies such as rainwater harvesting if well planned and implemented comprehensively, can solve intractable water scarcity related to climate change. Opportunities exist for RMI to share their experiences gained during the project with other SIDS, this will be facilitated through the support that will be provided by the UNDP office in Fiji that is also supporting other programmes in the region, as well as via other organisations and donors, such as SREP, Adaptation Network, World Bank etc. Finally, project learnings can be shared via GCF e.g. through GCFs website and forums such as the Structured Dialogues.

E.2.3. Contribution to the creation of an enabling environment

[40] Rural communities include: Communities of Majuro Atoll that are located outside the service area of MWSC; communities of Kwajalein Atoll that are located outside the service area of KAJUR; and communities located in the local government jurisdictions of the other 22 outer islands and atolls.

213. The scale of the proposed GCF project allows to address resilience in a systematic manner within a programmatic approach that combines national and local support and addresses local capacity including barriers

214. Weak governance, such as the lack of effective mechanisms and institutions to provide guidance and to develop strategies for climate change adaptation and mainstreaming, has so far prevented the adoption of effective short and long-term solutions for climate change and disaster risk management in RMI. The refinement of the JNAP framework and its operationalization, will provide the required structure to support the resilient development in all sectors. This new structure will also support decision and policy-makers with comprehensive perspectives of climate related issues, and in turn allow them to take informed decisions.

215. The project will support the development of capacity in climate change adaptation and disaster risk management, and build the capacity of institutions such as the NDMO and EPA. This will be done through training, and a facilitated process to develop disaster management and response SOPs. It will provide the required capacity (both human and materials) for effective collaboration mechanisms for disaster preparedness and response, and long-term strategy planning.

216. The project will support regulatory management in the water sector that promotes decentralized approaches to island and atoll level solutions for self-sufficiency for water production and management. Enabling decentralized approaches through participation of households and decentralized authorities in decision-making around operation and maintenance, can promote inclusive development and representative governance.

217. The implementation of the onground activities will also result in the strengthening of the market for rainwater harvesting and storage hardware. The extent of the project investment across RMI atolls and islands, coupled with improved O&M practices, will result in an increase in demand for parts for maintenance. The training provided to young people and by the practical training provided during project implementation will help provide potential resources for complimentarily SMEs for the service and maintenance of these systems.

E.2.4. Contribution to regulatory framework and policies

218. The project is in line with, and will contribute to the implementation of a number of regulatory frameworks and polices of RMI. The project is fully aligned with the following overarching national policies and strategies, including: National Strategic Plan 2015 – 2017, Vision 2018 (2001), National Climate Change, Policy Framework (2011), RMI Climate Change Roadmap (2010) and the Joint National Action Plan for Climate Change Adaptation and Disaster Risk Management (JNAP 2014-2018). Furthermore, the project directly implements the objectives and outcomes outlined in RMI's water sector policies and laws, including the National Water and Sanitation Policy (2014), and the National Environmental Protection Act 1984 (2016 amendment).

219. Other relevant polices that the project contributes to advance include: EPA Public Water Supply Regulations, 1994, Standard Hazard Mitigation Plan, 1994/2005, Disaster Risk Management National Action Plan 2008 – 2018, RMI National Emergency Response Plan (2010), the RMI Drought Contingency Plan (2010) and the National Gender Mainstreaming Policy.

220. Additionally, the project supports RMI in achieving various commitments and efforts under international agreements and mechanisms. Access to clean water is a basic human right and a universal development priority with great potential to improve health, life expectancy, education, food security and livelihoods. Sustainable Development Goal (SDG) 6 is: "to ensure availability and sustainable management of water and sanitation for all". The RMI Government has committed to achieving gender equity and social inclusion outcomes through ratification of numerous international and regional conventions including the Universal Declaration of Human Rights, the Convention on the Elimination of all Forms of Discrimination against Women (CEDAW), the Convention on the Rights of the Child (CRC), the Sustainable Development Goals (SDGs), the Beijing Platform for Action, the Revised Pacific Platform for Action for the Advancement of Women and Gender Equality and the 2012 Forum Leaders Gender Equality Declaration. The ACWA project will allow RMI to make significant contributions in advancing these international priorities.

E.3. Sustainable Development Potential

Wider benefits and priorities

E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

Environmental co-benefits

221. Reduced reliance on manufactured water (i.e. desalination) reduces energy usage and transportation impacts. Reduced consumption of bottled water results in less waste production – in particular, plastic waste which is particularly hard to deal with in SIDS.

222. Protection of wells will reduce contamination of groundwater; this has environmental benefits as groundwater helps support island vegetation.

223. Currently during periods of extreme drought, water is transported to remote islands and atolls of RMI by ship. With this project, this need will be avoided resulting in reduced greenhouse gas emissions from transportation. The reduction in migration pressure will also reduce transportation impacts.

Social co-benefits

224. The provision of rainwater harvesting systems and water supply will result in a social co-benefit by reducing household and community disputes over access to, and use of limited water resources during drought conditions. This will result in reduced damages to social cohesion, and will diminish the pressure on households located in outer atolls and islands, especially women who are responsible for domestic tasks and during periods of drought, women take on a disproportionate burden collecting water from mobile desalination units that are deployed to affected communities.

225. Disturbances in water supply, leading to water shocks and inadequate personal hygiene caused by drought, salination of aquifers, and consumption of contaminated groundwater are one of the main underlying factors contributing to vector/food/waterborne disease, diarrheal illness, skin and eye infections and other key climate and water-sensitive diseases. The provision of safe and clean potable water will result in decreased climate-sensitive disease, and will improve sanitation conditions, especially for women and girls living in outer atolls and islands of RMI.

226. Improved water harvesting systems in community buildings, including schools is expected to have a positive impact of the school attendance rate. The provision of training programmes for women and youth will furthermore strengthen technical skills and knowledge on climate change and its impacts. The project will also improve the decision-making processes and capacities of local communities by reducing the barriers of access to water and efficient water management practices, and by improving water, and subsequently food security.

227. Finally, migration from outer atolls and islands to urban areas of Majuro and Ebeye is expected to decrease, as households and communities will have access to water during periods of drought. The project, by covering all communities in outer islands and atolls, will reduce the likelihood of climate-induced migration in search of better living conditions in water secure areas.

Economic co-benefits

228. The primary quantifiable economic benefits of the proposed project are the avoided disaster response cost, the reduced time spent collecting water during drought and the avoided costs related to sickness and exposure to untreated water for drinking and cooking purposes. This in turn can lead to positive secondary impacts or co-benefit from improved productivity and long-term human development and wellbeing, which multiply the benefits of the initial investment.

229. The project will result in the creation of a number of jobs both during project implementation (refer Figure C7.1) along with construction roles, and post-project roles associated with ongoing operations and management eg CWCs and service technicians.

230. Additionally, as mentioned earlier, considering the scale of the investment, the project will develop the market for water and sanitation service delivery with knock-on impacts on the demand for technical and technology provision services and the employment multiplier that this 'green industry' could have. Anecdotal evidence supports assumptions that addressing water shortages will be source of job and income generation.

231. Another co-benefit mentioned earlier would be the stabilization of population in the outer islands, thereby creating alternative growth poles in the larger islands which would take pressure off Majuro and spread the benefits of growth more evenly, which will help to improve adaptive capacity for the population in the longer term. These

benefits are likely to manifest in the longer-term and will not be formally part of the results framework, though household surveys conducted for this investment will track trends.

Gender co-benefits

232. Improving water quality and supply at both community and household level will create more equitable access to water resources for vulnerable groups, including women, children and the elderly, and will improve health and education outcomes, enhance livelihoods, and reduce household and community level conflict caused by water shortages.

233. Benefits will include:

- Opportunities to generate additional income. Women and youth are more likely to respond to incentives that address their family's basic needs, such as better health and nutrition, as a result of water security measures and the provision of 20 lpcd of potable water.
- Women and youth from targeted communities will be trained in O&M and construction skills of household and rainwater harvesting systems, groundwater wells etc. This will enable women and young people living in rural areas who have limited employment opportunities to be actively engaged in designing, constructing, operating, maintaining and monitoring community water security investments, which will serve to build sustainability and increase employability;
- Focus, through training and awareness on WASH will support more equitable distribution of water resources during drought.
- Time-saving for women and youth as a result of lower hours in labour required for water management practices prior to the implementation of the project;
- Contribution to improved self-esteem and empowerment of women and youth in the community;
- Expanded involvement in public and project decision-making, and enhanced knowledge on climate change and efficient water practices as a result of formal and informal education programmes for women and youth;
- Effectiveness of awareness raising on climate change adaptation and its adverse impacts on the water, and agriculture sector in outer atolls and islands of RMI.
- New Standard Operating Procedures for household and community water security measures will be gender and age sensitive through the inclusion of GESI indicators.

E.4. Needs of the Recipient

Vulnerability and financing needs of the beneficiary country and population

E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

234. RMI is one of the most vulnerable countries to climate change given its high exposure and vulnerability to climate and disaster impacts. RMI is highly exposed to, and threatened by, sea level rise, extreme tidal events (such as king tides), as well as higher rainfall episodes with longer and more intense dry periods. The estimated cost for adaptation is one of the highest in the world in terms of percent of GDP at 7.24% (ranked eighth in the world)[41]. The average annual loss related to typhoons and tsunami/earthquake, was estimated to be around 1.7% of GDP (i.e. USD 3 million per year). In outer islands and atolls, 20% of the population lives on less than USD1 a day[42]. This socio-economic

[41] Nurse, L.A., R.F. McLean, J. Agard, L.P. Briguglio, V. Duvat-Magnan, N. Pelesikoti, E. Tompkins, and A. Webb, 2014: Small islands. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change .Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1613-1654. / Tsyban, A., J. T. Everett, J. G. Titus, and others. World Oceans and Coastal Zones. Australian Government Publishing Service, Canberra, Australia, 1990. http://risingsea.net/papers/federal_reports/IPCC-far_wg_II_chapter_6.pdf.

[42] Source; Nurse, L.A., R.F. McLean, J. Agard, L.P. Briguglio, V. Duvat-Magnan, N. Pelesikoti, E. Tompkins, and A. Webb, 2014: Small islands. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change .Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1613-1654. / Tsyban, A., J. T. Everett, J. G. Titus, and others. World Oceans and Coastal Zones. Australian Government Publishing Service, Canberra, Australia, 1990. http://risingsea.net/papers/federal_reports/IPCC-far_wg_II_chapter_6.pdf.

vulnerability exacerbates the impacts of climate change making communities in RMI more susceptible to these natural hazard events given their limited adaptive capacities.

235. In the remote atolls and islands of RMI, there is a lack of income-generating opportunities leading to high unemployment, financial hardship, factors providing incentives for urban migration from outer atolls and islands to Majuro, and international migration to the United States

236. Despite the recognition of the importance of enhancing water security, resilience, and governance in order for RMI to achieve its sustainable development aspirations, the government faces constraints in addressing water challenges at the scale and urgency that is required, without external assistance, especially in the context of anticipated impacts of climate change. The capital cost of proposed water investments will amount to USD 11,604 per household which is about 600% of the median household income in outer islands of RMI. Given that the national economy of RMI faces *high risk of debt distress* as per IMF's Debt Sustainability Analysis, it will be difficult for the Government to raise debt to finance the project. Therefore, grant financing from the Green Climate Fund is the most suitable financial mechanisms for to fund RMI's transformational change in the water sector.

E.4.2. Financial, economic, social and institutional needs

237. RMI is a lower middle-income country with a 2016 per gross national income per capita income of USD 5,280 (PPP) and nearly universal access to education and other services.[43] However, considering the remoteness of the outlying islands, the country fails in indicators such as under-5 mortality and infant mortality rates compared to other countries of similar income. Considering that RMI consists of a large number of small islands and atolls with only 180 km2 of land area spread over 1.9 million km^2 of ocean, cost of economic activity is high, and economies of scale are hard to achieve. The cost of providing of government services are high and constrained by logistical challenges.

238. After almost four decades under US administration, the Marshall Islands gained independence in 1986. However, under a Compact of Free Association with the United States, direct compact grants from the US account for nearly a quarter of the RMI GDP of USD 180 million. The total official development assistance received in 2016 was USD 57 million accounting for 32% of the national income. The remaining income of the country is derived from the service sector accounting for nearly 70% of the GDP, royalties from the fisheries sector and small-scale handicrafts and mostly subsistence agriculture. Industry is limited to the processing of coconut products and tuna.

239. As per assessments by the ADB[44], GDP growth in FY2016 was 1.9% and a contraction of 0.4% in FY2015. Assessments by RMI PDNA suggest that the GDP growth in 2016 was even lower[45]. The economy is projected to accelerate to 4% growth in 2017 due investments by the US in infrastructure and by a major water supply project in Ebeye funded by ADB, Australian DFAT and the Compact. This growth is likely to slow to 2.5% in 2018 when these projects come to conclusion.

240. Exports are low, and the non-diversified domestic economy has brought high dependence on imports, which are funded largely by the sale of offshore fishing rights and high levels of foreign aid. Foreign aid funds support a very large public sector that dominates the economy.

241. In fiscal year 2023 the US Compact grants are scheduled to expire. This requires the RMI to achieve long-term budgetary self-reliance and sustained growth the realization of which is severely hampered by significant challenges related to extreme weather-related events partially attributable to climate change. The International Monetary Fund based on consultations held in the RMI in July 2016 "emphasized the need for continued efforts to mitigate climate change risks, including explicit budget provisions for adaptation costs".

242. Nearly 75% of the population of RMI lives in the two urban centers of Majuro (29,006 as of 2017)) and Ebeye (10,932 as of 2017). Considering the limited economic opportunity and higher disaster vulnerability of the outlying island and atolls, these two centers have seen significant migration in recent years. Migration is also accelerating from Marshall Islands to the United States given terms under the Compact that Marshallese citizens may work and study in the United States without a visa. These forces of migration contribute to further decline of the outer island economy, therefore increasing further reducing the viability of public service provision.

43 Source: World Bank. Accessible here: https://data.worldbank.org/country/marshall-islands?view=chart
44 https://www.adb.org/countries/marshall-islands/economy
45 RMI (2017) PDNA

243. Limited employment opportunities in terms of the number and variety of jobs are a key economic and social challenge in Republic of Marshall Islands, where the public sector provides a very high number of formal jobs. According to 2011 census data, unemployment is not high (4.7%), but there is a very low level of labor force (only 12,924 out of 31,307of people aged 15 or older).

Financial Needs:

244. RMI faces budget deficits, substantial fiscal risks, and the expiration of the current Compact Grant Agreement with the United States in 2023. Private sector development is limited by remoteness, small market size, public sector and state-owned enterprise (SOE) dominance in major sectors, in a combination of weak business climate and constraining growth, making fiscal sustainability challenging. Household debt and debt service ratios are high, while the supervisory power and capacity of the Banking Commission is hindered by institutional and resource constraints[46].

245. Financial conditions regarding RMI's macro-fiscal situation, revenue profile, expenditure profile, and debt make external grant financing for the proposed water investments critical for RMI are as below:

- Overall fiscal balance has oscillated within a narrow range between -1.6 to 3.5% of GDP (except for the year FY2005 when it plunged to -22.3%). This is despite the pursuit of major policy changes and reforms undertaken by the GoRMI especially impacting the revenue.
- Fiscal position of GoRMI appears unrelated to the economic cycle. As instances, the government ran surpluses during the financial crisis of FY2008-FY2009 period (when real GDP growth was negative), but ran deficits in FY2012 and FY2013 when conditions had improved.
- The major source of tax revenue is income tax, accounting for US$11.8 million, or 39% of a total tax yield of USD 30.9 million in FY2015. This income tax, customs and other import duties which constitute second most significant category in terms of yield have not been buoyant sources of revenues for Government of RMI.
- Undiversified base of non-tax revenues: The collection from non-tax revenue sources of the GoRMI is around USD 17.8 million in FY2015, of which more than 88% is consequent to fishing fees (i.e. royalties).
- Diminishing but substantial dependence on grants: though steadily declining especially since FY2010, dependency on grants is still significant which account for over 50% of its expected revenues in FY2015. With regard to the grants from US (the single largest source), annual assistance to the RMI under the amended Compact has been diminishing since 2003. After the Compact grant period expires in 2023, the RMI is expected to complement domestic revenues with returns from the Compact Trust Fund, which receives annual savings from fiscal surpluses and contributions from development partners.
- No major structural change in expenditure portfolio: Expenditures by economic item are dominated by wages and salaries and spending on goods and services accounting for around 70% of total expenditure of GoRMI.

246. Declining nonetheless, significant indebtedness of the GoRMI: The ratio of central government debt to GDP has also improved and fallen from about 50% of GDP to 35% during the period but is still significant.

Institutional needs:

The GoRMI is facing significant institutional gaps in implementing the National Water and Sanitation Policy, as well as the National Environmental Protection act, including the following:

- Limited coordination, reporting and accountability mechanisms, including limited institutions and stakeholders with formalized roles and responsibilities at the subnational and community level are some of the institutional needs of the GoRMI.
- A disconnect between community-based and national level water coordinating mechanisms.
- Limited information generated and shared for all types of water resources at all levels, limiting transparency and evidence-based participatory decision-making at all levels.
- Limited accountability frameworks and participation at all levels of governance.

[46] IMF 2014. IMF Country Report No. 14/26. RMI. Staff Report for the 2013 Article IV Consultation.

- Limited effectiveness of water governance especially in terms of functioning institutions at the subnational level and coordination mechanisms with other sectors.

- Stakeholders and institutions working on political (i.e. participatory decision-making process related to water resources and distribution), social (i.e. equitable access and distribution, including women, children and vulnerable groups) and economic (i.e. application of cost effective and efficient solutions) dimensions of water are still limited at all levels.

E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

247. Climate change adaptation and water resilience is a key priority for RMI, and the country has developed a number of policies and plans to execute this commitment. The proposed project is aligned with and directly delivers on these priorities outlined by RMI's national development, climate change, water, and disaster risk management policy. Major policy frameworks in RMI this proposed project is aligned with include:

- Vision 2018 (2001) – is the first segment of RMI's long-term Strategic Development Plan Framework 2003–2018 and is the principal policy instrument guiding RMI's sustainable development. Climate change resilience and water sector improvements are part of three of its ten goals.
- The National Strategic Plan (NSP) (2015 – 2017) – is the roadmap for development progress in anticipation of the he scheduled completion of the U.S. Compact Agreement in 2023. Climate change and water resilience are highlighted as critical priorities in the NSP, particularly in achieving environment and climate change resiliency and infrastructure development. The water sector is positioned within the NSP as an important cross-cutting issue in promoting adaptation to climate change.
- RMI Climate Change Roadmap 2010 – is the national framework for climate change and sustainable development and refers to the need for drought resiliency.
- 2011 National Climate Change Policy Framework (NCCPF) - presents five strategic goals that aim to provide a pathway to an integrated, whole-of-RMI response to climate change.
- Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management (JNAP) for RMI highlights water resilience in face of climate change is a key issue highlighted
- Micronesia Challenge and Reimaanlok Action Plan – RMI's conservation plan which aims to aims to effectively conserve 30% of near shore marine and 20% of terrestrial resources across Micronesia by 2020. It also maps the course of actions to be taken by Marshall Islands, to establish and manage community-based conservation areas. Testing of the quality and quantity of the groundwater is part of the Reimaanlok process' household surveys (Reimaanlok steps 3-4).
- The GEF-UNDP project "Reimaanlok – Looking to the Future: Strengthening natural resource management in atoll communities in the Republic of Marshall Islands employing integrated approaches (RMI R2R)", which would synergize with this GCF-proposed project in 5 atolls"(RMI R2R)", which would synergize with this GCF-proposed project in the 5 atolls.
- National Water and Sanitation Policy and National Environmental Protection Act (Amendment) 2016 – provides a guideline and support the national and local governments in the formulation of water and sanitation laws, guidelines, strategies, investment plans, programs and projects, as well as a framework for the management of freshwater resources, water supply, safe disposal of excreta and wastewater and the promotion of hygienic behaviors. The amended Act in 2016 also designated RMI Environmental Protection Authority (EPA) as the Water Office, who will monitor and implement the National Water and Sanitation Policy and the 5- year National Water and Sanitation Policy Action Plan.
- The proposed GEF-funded regional project "Managing Coastal Aquifers in Selected Pacific SIDS" covering RMI, Palau and Tuvalu, which will improve the understanding, use, management and protection of coastal aquifers

towards enhanced water security within the context of a changing climate. This project with potential funding of $5.24 million, over 30% of which will be for RMI, will directly complement this proposed GCF project.

248. Furthermore, the project aligns with and delivers on key international goals and frameworks that RMI is committed to, including the United Nations Framework Convention on Climate Change (UNFCCC), the Sendai Framework for Disaster Risk Reduction 2015-2030, and the Sustainable Development Goals (SGDs) – especially SDG6: Ensure access to water and sanitation for all, SDG 5: Achieve gender equality and empower all women and girls, and SDG 13: Take urgent action to combat climate change and its impacts.

E.5.2. Capacity of accredited entities and executing entities to deliver

249. The United Nations Development Program will execute this GCF project as per a request made by the Government of the Republic of the Marshall Islands. UNDP has extensive experience as the Executing Entity of climate change adaptation projects globally as has already been discussed in Section C4.

250. As a UN agency, UNDP must comply with the Harmonized Approach to Cash Transfers (HACT) Framework, which represents a common operation framework for UN agencies' transfer of cash to government and non-government implementing partners. As part of this proposal development, UNDP commissioned HACT micro assessments to assess the RMI government's control framework. The HACT assessment provides a risk rating that can be used to help select the appropriate modality for an implementing partner. The assessment for RMI resulted in 'moderate' risk for the assessed implementing partners. UNDP will be the Executing Entity for this project as Direct Implementation Modality (DIM) was determined to be the most appropriate.

251. Globally, UNDP works in nearly 170 countries and territories and it focuses on helping countries build and share solutions in three main areas of sustainable development: democratic governance and peacebuilding, and climate and disaster resilience, all of which contribute to the achievement of poverty eradication, reduction of inequalities and exclusion. Long-term capacity building of partner countries is a critical element of UNDP's approach to work. The proposed GCF project is in line with the underlying principles of UNDP's mandate: The project contributes to reducing the vulnerability of a SIDS to imminent climate risks while contributing to the capacity building of the nation at all levels.

E.5.3. Engagement with NDAs, civil society organizations and other relevant stakeholders

252. Based on request received from RMI Government on June 2015, UNDP in partnership with Office of Environmental Planning and Policy Coordination (OEPPC), RMI's National Designated Authority (NDA) for the Green Climate Fund (GCF), and stakeholders in RMI have worked towards the development of the proposed project. Various stakeholders were consulted and participated in the developing of the project – including the President, national government representatives from various Ministries and Departments, Mayors, Senators, village chiefs, school teachers, health practitioners, school children, women and men's group members, youth groups, public utility companies, shipping companies, civil society organizations, international agencies, universities, development partners, regional agencies, etc. Meetings, workshops, surveys, focus-group discussions, and site observations were used as ways of capturing stakeholders' perspectives, experience, and knowledge into the proposal design as well as keeping stakeholders informed of the proposal development process and progress.

253. From May 2015 – February 2017, the Government of RMI in partnership with UNDP held 5 national stakeholder consultation meetings (including a broad stakeholder meeting on 9 Feb 2017). Six technical assessments missions were made s largely supported by UNDP itself as well as other bilateral organizations notably the Ministry of Foreign Affairs and Trade (MFAT) of New Zealand, USAID Adapt Asia-Pacific and Pacific Climate Ready projects, and the Korea Environmental Industry & Technology Institute (KEITI). The team of UNDP experts collaborated with thematic experts in the areas of gender, financial and economic sustainability, and water engineering contribute to the project design process in-country in RMI and remotely. Thirty-three community visits were conducted where men and women's group consultations were held and site surveys were conducted to assess the structural condition of the existing water infrastructure. These community consultations and assessments implemented in partnership with Women's United Together Marshall Islands (WUTMI) and Marshall Islands Organic Farmers Association (MIOFA). Some of the community consultations were conducted together with GIZ and SPC as part of their design and implementation of water initiatives in rural communities of RMI. Government leaders (Senators and Ministers), Mayors and traditional leaders, government department staff (OCS, OEPPC, Ministry of Public Works, EPA, etc) also joined the community consultation missions. Various regional, international, and civil society organizations also

provided significant inputs and resources (in terms of their experts' time and knowledge), which influenced significantly the project scope, implementation methods, coordination mechanisms, and activities. These stakeholders include, but are not limited to: IOM, ADB, College of the Marshall Islands, IFRC/MIRSC, Embassy of Japan/JICA, MFAT, Salvation Army, SPC, SPREP, US Navy / Seabees, World Bank, etc.

254. Men, women, children, and all stakeholders were consulted. For the community surveys conducted by MIOFA, WUTMI, and UNDP as part of the project design process in 36 communities across 22 local government jurisdictions, 64% of respondents were women. Summaries of the stakeholder consultations are contained in the Gender Analysis and Action Plan Annex XIIIc and Annex II Feasibility Study – Annexes 20 and 21

255. A Project Validation Meeting was held on 10 March 2018 to appraise and provide feedback on the full proposal document (see Annex VII).

E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project/programme

E.6.1. Cost-effectiveness and efficiency

256. A grant is deemed the most suitable form of GCF financing for two reasons: a) GoRMI's ability to service a GCF loan from budget or capital market sources is severely constrained; and b) the project will not generate revenues.

257. GCF funding will play a key role in relation to the evident gaps in current baseline water resource investments. Together with the co-financing being mobilized for the proposed project, GCF funds will enable the GoRMI to address the urgent climate adaptation needs in the outer atolls and islands' most vulnerable areas, while also addressing the

258. As discussed in Section E4.2, RMI's revenues depend on the US Compact, which is due to expire in 2024. RMI has been building a Compact Trust Fund to complement domestic revenues once the Compact ends, however it has been assessed to be insufficient to generate the returns to replace the Compact[47]. The largest sources of domestic revenue are taxes on trade and consumption, a small percentage of income, closely followed by revenue from taxes on income and profits. Remittances make up only 14.3%of GDP[48]. Contributions from donors account for approximately 60% of the annual budget. This provides context for the challenges the government will face in co-financing activities for future climate response infrastructure enhancements and disaster response activities after 2023.

Selection of interventions

259. Marginal Abatement Cost Curves (MACC) were used to assess the most cost-effective sequence of water supply augmentation measures to ensure water security by 2045 for targeted islands/ atolls (refer to Annex II –Feasibility). Five intervention categories were analysed:

- Improvement of household rainwater harvesting structures (HH RWH)
- Improvement of community building rainwater harvesting structures and increase in storage tanks (CB RWH)
- Construction of new community-based roof structures in combination with a storage tank (new RWH roofs and tanks)
- Rehabilitation of existing concrete storage tanks (concrete tank rehab)
- Mobile reverse osmosis units (mobile ROs)

260. The Feasibility Study also identified the importance of rehabilitating and protecting groundwater wells as groundwater is an important complementary water source for non-potable water uses. However, uncertainty around groundwater quality meant it could not be considered as an additional, reliable drinking water source for the purposes of cost-curve analysis.

261. The cost curve analysis includes the maximum possible number of beneficiaries and volumetric benefit for each intervention. The analysis of the possible interventions was conducted for each island/ atoll separately.

262. Three categories of costs were considered for the entire project period of 26 years, starting with the implementation phase (2020-2045):

[47] US Department of Interior – Trust Fund for the People of the Republic of Marshall Islands Financial Statements Sept 2015
[48] World Bank Group April 2017 - Migration and Development Brief 27

- Capital expenditure
- Sustenance expenditure
- Operation and maintenance expenditure

263. The costs were discounted at 10% to derive the net present value. The unit costs for each intervention were based on the annual volumetric benefit from each intervention and the equivalent annual cost (EAC) of each intervention. Transportation costs were not included, as these would be similar per intervention.

264. Based on the cost-curve analysis, the three most cost effective intervention types to meet the water security target were CB RWH improvement & storage; CB RWH roofs; and HH RWH improvement (Table E6.1.1).

Table E6.1.1 Comparison of cost-effective ones and total possible interventions (cost effective interventions shaded).

Intervention Type	Max # interventions	# Cost-effective interventions	% included
CB RWH Improvement & Storage	155	147	95%
CB RWH roofs	445	140	31%
HH RWH Improvement	2,524	1635*	65%
Concrete Tanks Rehabilitation	23	-	0%
Mobile RO	54	-	0%

* number of interventions has been increased from 1635 to 2248 for implementability, gender and social equity reasons

265. The above-mentioned intervention mix, which is solely based on the criteria of cost-effectiveness, was re-evaluated considering implementabilty, social and gender aspects. Based on these criteria, it was decided to provide household Rainwater Harvesting Improvements to all target households with dysfunctional rainwater harvesting systems. The remaining water supply demand gap, if any, will be closed by choosing the next most cost-effective intervention on each island/atoll.

266. The MACC curve calculations resulted in household RWH improvements not being selected as a cost effective option for three atolls. The proposal includes providing household RWH improvements for these three atolls since the households rely on rainwater for drinking and cooking and the household tanks will not fill without functioning gutters and downpipes (Enewetak has an RO unit, with an expected lifecycle to last the 25 year project period, but it does not provide the full target 20 lpcd, only 11 lpcd). Household RWH systems have significant advantages over community RWH systems as they are available at the household level, therefore removing any equity or accessibility issues when compared to community RWH tanks.

267. The budget to 2045 also includes for O&M and renewals for all household RWH improvements, ensuring their sustainability over the long term. If household RWH improvements are not budgeted for over the long-term, the lack of maintenance and renewals is likely to lead to failure of the systems in these three atolls and 0% of the household storage available on the first day of a drought in 2045. This is significant as the existing HH RWH storage is almost three times greater than the existing community storage in most atolls.

268. Applying these principles to the results from the cost-effective approach the final intervention mix is shown in Table E61.2.

Table E61.2. Overview of final interventions to meet the water security target (differentiated by baseline and climate induced drought)

	Total m^3	Interventions #		
		# CC buildings	# new roofs and tanks	# HH
Baseline Drought				
CC RWH Improvement & Storage	3,204.89	69		
CC RWH roofs	1,364.36		29	
Concrete Tanks Rehab	-			

HH RWH Improvement	6,733.05			1,937
Sub-total	***11,302.30***			
Climate Change Additionality Drought				
CC RWH Improvement & Storage	4,170.69	89		
CC RWH roofs	4,032.00		92	
Concrete Tanks Rehab	-			
HH RWH Improvement	957.93			311
Sub-total	***9,160.62***			
Total Baseline and Climate Change Additionality				
CC RWH Improvement & Storage	7,375.59	158		
CC RWH roofs	5,396.37		121	
Concrete Tanks Rehab	-			
HH RWH Improvement	7,690.97			2,248
Total	***20,462.93***	158	121	2,248
Additional HH RWH for social equity	**345.28**			**281**
Grand Total (incl. 100% HH RWH)	**20,808.21**	**158**	**121**	**2,529**

E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

Not applicable

E.6.3. Financial viability

269. The financial viability of the project was assessed as part of the Economic and Financial Assessment, which is summarised in Section F1 and detailed in Annex XII. Overall, it was concluded that the project yields a positive net present value when considering the same target criteria, i.e. 20 lpcd, for the baseline and the project outcome.

270. Post-implementation of all interventions, the water assets developed will continue to have a useful life for 18 years. During this period the following expenditure is required:

- USD 5,325,044 for operation and maintenance of water assets. This includes the cost of spares and supplies required for general maintenance, the travel cost to undertake regular repairs and upkeep tasks, and the staff cost at Majuro for O&M supervision
- USD 1,562,701 for sustenance capex, which includes reinvestment in certain sub-components or assets and major repairs of water assets estimated as 5% of capital cost once every 8 years required to optimize the assets lifespans.
- USD 7,084,315 for full replacement of specific water assets and components that have a shorter life than the total project lifecycle period of 25 years

271. The total cost to be incurred to ensure continued operation of the water assets is USD 13,972,060.

272. The long-term financial viability of the project beyond the Fund intervention will depend on the ability to finance this continued operation and maintenance of water assets. Good practice is to fully recover the cost of operation and maintenance through user fees. As per IBNET standards for good practice in tariff setting, affordable water tariff has to be less than 2.5% of the annual household income. The median household annual income in outer atolls is USD 1,936. Given this low household income level, it is difficult to achieve full cost recovery. For full cost recovery, households in outer atolls will have to contribute up to 40% of their median annual income. In order to just recover O&M costs, households will have to provide anywhere between 7% and 17% of their annual median income in a given year. As this is considered unaffordable, the funding for O&M during post-implementation period (18 years) will be provided by the Government of RMI. To this effect, the Government of RMI has issued a commitment letter (Annex IV).

E.6.4. Application of best practices

273. This project extracts and scales good practices and lessons learned from the various water security and resilience initiatives implemented in RMI and in similar small island developing states in the Pacific Region. All water technologies and investments proposed are based on data collected and analyzed based on technical and cost effectiveness as well as ways as experiences of successes and failure based on political, logistical, cultural and behavioral contexts.

274. Resilient Design Principles were defined through the Technical Feasibility Study process. These 7 principles include: Ownership, Redundancy, Effectiveness, Efficiency, Sustainability, Equity, and Coordination. A comprehensive analysis of relevant water security and resilience options (mainly technologies where people indicated their interests in exploring during the consultations), were reviewed against the principles to analyze for their applicability as technologies to be included in the project design. This analysis resulted in the Resiliency Scores. (Annex II Feasibility Study).

275. The applicable technologies were then prioritized based on life-cycle cost-effectiveness calculation. This process identified public reticulation system, household and community rainwater harvesting improvements as best practices for people in RMI to improve water security, and groundwater and concrete tank rehabilitations.

276. An array of technologies was reviewed by intervention to determine the engineering and technical designs as well as implementation strategies including considerations for procurement methods, transportation frequency and channels. Additional, the types of training, awareness raising and institutional support (i.e. support from Majuro, contractors, etc.) were also explored and incorporated into the project design based on lessons learned from past experiences. These include technical training and community awareness raising required for constructions, operation and management, and monitoring and reporting (including oversight required to ensure environment, social, and gender considerations).

277. The key technology innovation in the Project is the use of flat pack modular tanks for new community rainwater storage. This is seen as innovative as the existing rainwater storage tanks in RMI are either plastic or concrete. Plastic tanks are a suitable option at the household level. Community buildings typically have a much larger roof catchment area than households and need larger storage tanks to optimize rainwater capture. The existing large rainwater storage tanks in RMI are almost all concrete, possibly due to the historical construction of concrete tanks during the world wars. Flat pack modular tanks are a modern alternative to concrete tanks and are considered to be the suitable option for the large-scale construction of new tanks throughout RMI. Flat pack modular tanks offer a significant number of advantages over the plastic or concrete tanks (see Annex II - Feasibility Study).

278. Cyclone resilience was a risk considered during the design process. The costing and design for the flat pack modular tanks made of HDPE panels includes platypus anchors driven into the ground to provide additional anchor points to withstand equivalent wind speeds. The tank design also meets the New Zealand Climatic and Seismic standards and ratings (i.e. open areas equivalent to cyclone wind speeds). Similar installations have been constructed in Tahiti and Mala Mala, Fiji.

E.6.5. Key efficiency and effectiveness indicators

GCF core indicators	Estimated cost per t CO_2 eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)
	Not applicable
	Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)
	Not applicable

Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project/programme)	Not applicable

F.1. Economic and Financial Analysis

Economic analysis

279. The economic analysis of the proposal was conducted during the design phase, focusing on one major output, namely Output 1*: 'Implementation of optimal mix of interventions to ensure water security in outer atolls and islands of RMI'*. As Output 2 (*Optimization of alternative water sources to reduce reliance on harvested rainwater*) and Output 3 *(Drought preparedness and response measures implemented in outer atolls and islands)* are integral parts of the project to ensure water security of 20 lpcd in the Marshall Islands in times of climate change, the benefit streams from the three outputs cannot be assessed separately. Thus, the costs and benefits of each output are analysed conjointly.

280. Addressing Climate Vulnerabilities in the Water Sector in RMI (ACWA) has four key benefit streams. Firstly, mobile and three stationary reverse osmosis (RO) units do not have to be further maintained, replaced and stored for a potential emergency relief mobilization during times of drought. Secondly, as water security is ensured, costly emergency operations to provide the absolute minimum of drinking water to outer islands/ atolls via mobile RO units and bottled water will no longer be required. Thirdly, the outbreak of drought-related diseases due to lack of water for WASH and resultant health treatment costs will be avoided. Lastly, no loss of productive labour will be caused by increased water collection time during droughts.

281. The economic benefits that are valued in the economic analysis of the project are based on: 1) avoided costs of procuring, maintaining and storing additional mobile reverse osmosis (RO) units to provide emergency relief during times of drought; 2) avoided drought emergency response costs, including mobile RO unit deployment costs; and 3) avoided socio-economic drought related costs and losses.

282. While the log frame and the budget distinguish between interventions required to ensure water security during *baseline* and *climate-change induced droughts,* the economic analysis considers these jointly. This is due to the fact that the benefits resulting from the project are difficult to segregate between the interventions targeted at the baseline and climate-change induced drought. For example, if the interventions targeted at the baseline drought were insufficiently implemented, the benefits of the interventions targeted at the climate-change induced drought would not materialise, as the interventions would be used to meet the needs for the baseline drought instead. Likewise, some disaster responses, such as the mobilization of mobile RO units, are required only once per drought event – regardless whether this drought is a baseline drought, or a climate-change induced drought. This would complicate the allocation of benefits. Seeing the targeted water security for RMI as a holistic and mutually dependent cause, these benefits will be assessed jointly over the project period.

283. The benefits of this project occur when water security is ensured during a drought, when compared to the status quo. The report on *Climate Change Projections for the Republic of Marshall Islands*, which was conducted as part of this FP, illustrates the current (baseline) occurrence of drought over a period of 20, 30 and 60 days, distinguishing between the northern and southern islands/ atolls. A 'typical but impactful drought' occurring across all islands/ atolls in RMI is defined as a 30-day drought in the southern atolls and a 60-day drought in the northern atolls. It further predicts the change in frequency and duration of these drought events from 2035 onwards. It is defined that a benefit for an atoll/ island community arises when the project ensures water security for a community during a drought period, which goes beyond the water security provided by their existing water storage (status quo). For example, if a community facing a 30-day drought has sufficient storage for 10 days and the project ensures water security for the remaining 20 days, this community is per definition a beneficiary of this project. An overview of the assumptions made can be seen in Table F1.2 below.

Table F1.2. Overview of assumptions on drought frequency and duration, as well as population affected

	20 day drought	30 day drought	60 day drought	typical but impactful drough
Weather Stations 1-4 (Northern Atolls)				
Population (2017) affected	*2657*	*3779*	*7619*	*9572*
% total population (2017)	*0.28*	*0.39*	*0.80*	*1.00*
frequency (1 in x years) (2017-2034)	*1.23*	*2.33*	*5.98*	*6.00*
frequency (1 in x years) (2035-2045)	*0.93*	*1.52*	*4.29*	*5.00*
# days (2017-2034)	*20*	*30*	*60*	*78*
# days (2035-2045)	*32*	*47*	*95*	*112*
Weather Stations 5-7 (Southern Atolls)				
Population (2017) affected	*3,724*	*4,379*	*5,771*	*6,000*
% total population (2017)	*0.62*	*0.73*	*0.96*	*1.00*
frequency (1 in x years) (2017-2034)	*2.77*	*6.03*	*31.50*	*6.00*
frequency (1 in x years) (2035-2045)	*1.68*	*5.29*	*12.18*	*5.00*
# days (2017-2034)	*20*	*30*	*60*	*40*
# days (2035-2045)	*31*	*46*	*93*	*61*

Note: The highlighted cells indicate the composition for a 'typical, but impactful drought'

284. It needs to be noted that two alternative options can be considered for assessing the baseline against which benefits of the project are assessed, namely:

- Baseline scenario 1: The Government of RMI provides 20 lpcd to the drought affected target population by deploying mobile RO units. Currently, of the existing 54 mobile RO units, 49 can only provide 4.2 lpcd during a typical but impactful drought by 2044 - thus additional mobile RO units would have to be procured to achieve this goal.[50] As 20 lpcd would be provided in this baseline scenario – as it would in the project outcome - the economic analysis does not consider avoided socio-economic costs (benefit stream #3) to avoid double counting of benefits.
- Baseline scenario 2: The Government of RMI continues providing 4.2 lpcd with the existing 54 mobile RO units to the drought affected target population and will not procure additional mobile RO units, which would be required to provide 20 lpcd during drought events, due to financial constraints. As only 4.2 lpcd are provided in this baseline scenario, socio-economic costs resulting from insufficient water supplies will be avoided as project outcome. Thus, these avoided socio-economic costs (benefit stream #3) are considered in the economic analysis.

285. The economic benefits introduced above are based on the drought costs for the 2015/16 drought and on the existing water supply infrastructure. The 2015/16 drought is the only drought with detailed information on emergency response costs and an estimate on the drought-related socio-economic costs and losses. As future (modelled) drought events differ in duration and frequency, and the affected population differs with drought duration and population growth, the benefits are scaled accordingly, where adequate. Considering the implementation period, benefits are not accounted for droughts occurring in year 1 and 2 of the project and only partially at 1/3 for year 3 and 2/3 for year 4. From year 5 onwards benefits are fully accounted for.

286. The avoided costs of maintaining and storing mobile reverse osmosis (RO) units (benefit stream 1) are based on current procurement costs, annual O&M, storage costs and capex costs for replacement of RO units after their lifetime within the project period.[51] The number of mobile RO units differs between baseline scenario 1 and 2. For baseline scenario 2, the existing 54 RO units are considered. While these are not required to ensure water security for drought events within the 95th percentile predictions after project implementation, GoRMI wishes to maintain these in case of droughts beyond this prediction and other disasters. Thus, the benefits of avoided costs for not having to maintain the 54 mobile RO units are not considered. For baseline scenario 1, the number of RO units is scaled up across the project period depending on the severity of droughts and can be seen in the sheet 'Output RMI'. [52] In this scenario the avoided costs are considered as benefit stream.

287. The avoided drought emergency response costs (benefit stream 2) are divided into two key interventions. Firstly, the disaster response costs for outer islands incurred by NDMO and IOM for purely drinking water related relief support during the drought 2015/16 were scaled to account for future predicted drought events per affected person and day. Secondly, the avoided costs for deployment of mobile RO units in case of emergency is assessed on community basis and is subject to the existing communities' water supply. For baseline scenario 1, mobile RO units

will be deployed to a community if their existing water supplies are insufficient to provide 20 lpcd. For baseline scenario 2, mobile RO units will be deployed to a community if their existing water supplies are insufficient to provide 4.2 lpcd.

288. The avoided socio-economic drought-related costs and losses (benefit stream 3) are composed of two key impacts, as described above, and are based on the Post Disaster Needs Assessment (PDNA) of the 2015/16 drought conducted in February 2017. The PDNA determined the number of drought-related diseases occurring due to lack of water for WASH and determined the respective treatment costs.[53] To transfer this information to future drought events, the number of new cases per drought day and the respective treatment costs per case are determined. Further, the PDNA quantifies the loss in productive labour due to increased water collection time by assuming a minimum wage of USD 2/ hour. To apply these estimates to future drought events, the per capita value per drought day of the affected population was derived. As these negative effects are avoided when having sufficient water available (20 lpcd) this benefit stream is only considered for baseline scenario 2.

289. As mentioned above the cost-benefit analysis was performed considering two baseline scenarios to provide a more differentiated assessment. The economic analysis indicates that for baseline scenario 1, the net present value is positive, and the expected economic internal rate of return is 12%, which exceeds 10%, the economic opportunity cost of capital. Sensitivity testing of the main assumptions, i.e. total project budget, the deployment costs for mobile RO units to drought affected islands/ atolls, and the frequency of a 'typical, but impactful drought' showed that NPV remains positive even if the total budget increases by 10% and the drought frequency of a 'typical but impactful drought' reduces by 15%. The respective EIRRs are 10%, and 12%. However, the analysis is sensitive to the average avoided deployment costs for mobile RO units. A cost reduction by 30% resulted in a negative NPV with the EIRR of 8%.

290. The economic analysis indicates that for baseline scenario 2, the net present value is negative, and the expected economic internal rate of return is 4%, which is below the economic opportunity cost of capital of 10%. Sensitivity testing of the main assumptions, i.e. total project budget, the deployment costs for mobile RO units to drought affected islands/ atolls, and the frequency of a 'typical, but impactful drought' showed that NPV remains negative, unless the total project budget is reduced by 37%. The resultant EIRR is 10%. This can be explained by the fact that the assessed benefits mostly result from Output 1, while the costs are considered across all outputs. The additional benefits from Output 2 and 3, such as a potential positive impact on food security during drought events, are difficult to quantity at this stage of the project, leading to an overall negative NPV.

291. The project is expected to generate at least three additional benefit streams. However, these are not easily quantifiable and in some cases confidence in the values may be low. Firstly, the population of the outer islands/ atolls typically have house gardens or small agricultural areas in which they produce crops for their own consumption. During the drought, groundwater resources – where available – either became too saline to irrigate the crops or the groundwater had to be used to meet minimum drinking water requirements. This led to a loss of harvest, which significantly affected food security and required food aid during and after the drought. Given that little is known to date about the quantity and quality of groundwater, it is not possible to quantify the impact of protecting groundwater reserves (output 2) and reducing water demand from groundwater (output 1) on crop production – thus this benefit stream could not be quantified. Secondly, the population from outer islands/ atolls – after

[49] With the design capacity of the mobile RO units being 57 l/h and – as they are solar powered – assuming they can run 8 hours/day, their assumed actual capacity is 456 l/day. More information on the model can be found here: https://www.spectrawatermakers.com/us/us/11140-aquifer-360

[50] The assessment of the current capacity of existing RO units of supplying water to affected citizens, is based on the total water requirement for a typical but impactful drought by 2044 and has been validated with the total number of deployed mobile RO units during the drought events of 2013, 2015/16 and 2017. As this analysis assesses the situation of each community, and only considers water provision by mobile RO necessary for affected communities, i.e. those which do not have sufficient storage for the full drought period, total possible water supply provision is 4.2 lpcd instead of 1.6 lpcd which would consider a water supply provision for each and every citizen. Further information on the assessment can be found in sheet 'Avoided RO deployment costs' in the attached Excel file.

[51] Information provided by NDMO

[52] To allow for a conservative estimate, the design capacity of 1360 l/day of the RO was considered, rather than the reported actual capacity of 453 l/day (NDMO).

[53] Due to insufficient medical facilities and lack of medication in some islands/ atolls, the affected population was advised not to consult the medical center. Thus, it is likely that the total number of drought-related diseases was higher, allowing for a conservative estimate (PDNA, 2017).

completion of the project - do not have to migrate to the two urban centers, i.e. Majuro and Ebeye, in search for water, reducing the pressure from these urban centers to provide basic services to these temporary migrants. Further, schooling for the migrant children is likely to be disrupted, thus this project avoids a future economic loss for these children due to an education loss. As no exact data on the number of migrants and the resultant additional cost in previous droughts is known – as these mostly lived in informal settlements – this benefit could not be quantified. Thirdly, it can be assumed that the population of the outer island has a certain willingness to pay (WTP) for water security. However, as no transferable WTP studies are available, and water bottles are usually not for sale in outer islands as a proxy, this benefit stream was left unquantified. The implication of ignoring these additional benefits is that the estimates of the economic IRR and NPV are at the lower bound and provide conservative estimates of the value of the project.

292. Overall, it can be concluded that the project yields a positive net present value when considering the same target criteria, i.e. 20 lpcd, for the baseline and the project outcome. In this case (baseline scenario 1), the results are partially sensitive to scenarios where expected benefits/costs are assumed to be significantly lower than otherwise estimated in a baseline scenario. When expecting that the Government of RMI will remain with its current status quo of supplying a maximum of 4.2 lpcd during drought events (baseline scenario 2), the project is expected to yield a negative net present value. However, it needs to be noted that a number of benefits could only be assessed qualitatively and that their consideration would likely yield a positive net present value.

293. The details of the economic analysis are presented in Annex XII of this proposal.

F.2. Technical Evaluation

294. There are no freshwater streams on any of the outer atolls/islands and only one island has a freshwater pond that is far from inhabited areas. A list of the multiple water supply options to enhance water security was developed from those currently in use in RMI and those that have been used in other small island developing states (refer Section C2 and Annex II Feasibility Study - Section 7). Lessons learned from other installations and best practices were examined and utilized in the comparison of the technology options. The options broadly included rainwater harvesting, groundwater and desalination.

295. The suite of water supply options was then assessed using a Multi-Criteria Assessment (MCA) (refer Annex II Feasibility Study) for the provision of safe drinking water against the criteria of resilience to baseline and climate change induced droughts, potential for environmental impacts, sustainability of operations and maintenance, social acceptability, proven local adaptability of the technology etc.

296. Reverse Osmosis desalination units are the most resilient option to provide drinking water during a climate change induced drought, and small units can be made ready for deployment to where needed. However existing installations in the remote outer atolls and islands have experienced significant issues with the spare parts supply chain, lack of local technical expertise for sustainable maintenance and an inability to secure long-term funding for operations and maintenance. Simpler and lower cost desalination technologies (such as solar distillation) have been trialed in some local communities, but installations were found abandoned due to poor operations and maintenance (units were not maintained during the wet season, which led to clogging in the dry season). Solar distillation units would also have a very large footprint requirement when scaled to provide 20 lpcd. Developing groundwater sources to enhance water security was ruled out through the MCA process due to the increasing vulnerability of groundwater to climate change induced saline intrusion and the need to provide disinfection to ensure drinking water quality (existing groundwater sources are vulnerable to microbiological contamination).

297. The shortlisted water supply options from the MCA process were rainwater harvesting at the household and community level and mobile RO units. These options were carried forward to the cost effectiveness curve analysis, along with rehabilitation of existing concrete tanks for rainwater storage. Rainwater harvesting was considered at the household level and at the community level to supply clusters of households. Where there were insufficient existing community buildings for new tanks, a third rainwater harvesting option was included, new roof structures with associated rainwater harvesting systems and storage tanks.

298. The water security target was set at a minimum of 20 litres of drinking water person per day for a year-round supply based on the WHO standard for dealing with long term drought periods. This target provides for drinking, cooking and personal hygiene.

299. The drought duration target was estimated for each of the seven weather station areas after assessment of baseline conditions and the prediction for the number of additional days of drought due to climate change over the planning horizon to 2045. The baseline drought durations were estimated from assessment of available climate data (at least 18 years for the remote outer atoll weather stations and over 50 years for the two urban atoll weather stations).

300. The baseline gap in water security was assessed from rainwater tank modelling of the total stored water available on the first day of a theoretical baseline drought under status quo conditions (assuming normal monthly rainfall prior to a drought along with existing household and community tank volume and existing RWH system condition and roof catchment area and RWH system efficiency from available infrastructure survey data and RMI wide assumptions for data gaps). The baseline gap in water security is the water supply requirements for the baseline drought minus the existing water supply available on the first day of drought under status quo conditions.

301. The gap in water security due to climate change additionality was assessed from rainwater tank modelling of the total stored water available on the first day of a theoretical drought in 2045 (assuming projected monthly rainfall in 2045 prior to a drought along with improved RWH system condition and roof catchment area and RWH system efficiency).

302. Marginal Abatement Cost Curves (MACC) were developed to assess the cost effectiveness of each of the shortlisted water supply options to address the baseline gap and climate change additionality gap in each outer atoll/island. The most cost effective option in each outer atoll/island was typically the household rainwater harvesting improvements (baseline intervention as a development need not climate change additionality). The next most cost effective option was typically new storage tanks at the community level either at existing buildings (with associated rainwater harvesting improvements for the connected buildings) or at new roof structures (where there are insufficient existing community buildings for new tanks to be connected). The results varied by atoll. The MACC results by atoll/island were then distributed to each community in the atoll/island based on the community level water supply demand gap analysis for baseline and climate change additionality droughts.

303. While the primary focus of this project is to improve water supply resilience to adapt to climate change, it is recognised that if combined with sanitation and hygiene initiatives, the water supply interventions will deliver substantially more development benefits. To this end, this project will harmonize with other projects such as: the GEF-funded project "Managing Coastal Aquifers in Selected Pacific SIDS" which will include interventions that will protect groundwater resources in several outer islands, including improvements in sanitation; and the ongoing Pacific Islands Regional Ridge-to-Reef Program, which includes interventions in the Laura lens in Majuro atoll to address waste management issues, that can provide lessons useful in the other atolls.

304. Details of background and technical assessments and methodology are contained in Annex II – Feasibility Study.

F.3. Environmental, Social Assessment, including Gender Considerations

305. As part of the project development, environmental and social baseline conditions were identified (refer relevant thematic sections of ESMF). The design of the project considered baseline conditions and the potential impacts that various options might have in terms of environmental and social impacts, including direct and indirect impacts.

306. Based on environmental and social impact risk assessments, various mitigation strategies were developed that will be used to ensure that risks were managed and maintained at an acceptable level. These are documented in the ESMF.

307. This project has completed the UNDP social and environmental screening procedure (see SESP attached as Annex VIa). This screening was undertaken to ensure this project complies with both UNDP and GCF Environmental and Social Standards. UNDP's Social and Environmental Standards were reviewed by the GCF accreditation panel and deemed sufficient to accredit UNDP to submit low and medium risk projects.

308. The overall social and environmental risk category for this project is moderate. Based on the findings of this assessment, an Environmental and Social Management Framework (ESMF) has been developed for the project (see Annex VIb). Specific project risks are listed in Section G below, together with appropriate mitigation measures.

Environment and Social

309. The ESMF provides a framework and guidance for further development of site or activity specific environmental and social work plans. To ensure that the environmental and social objectives of the project and UNDP/GCF standards are met, the ESMF will be used by the project implementers to structure and control the environmental management safeguards that are required to avoid or mitigate adverse effects on the environment.

310. As ACWA activities become better defined, the environmental and social management plans (ESMPs) specific to those activities can be developed, using the ESMF as a basis for risk assessment and mitigation strategies

311. The project is likely to have some short-term, small-scale environmental impacts during implementation, but will ultimately have considerable, long-term environmental benefits (See Section E.3.1).

312. Through delivery of the outputs, communities in RMI will be better equipped to deal with climate impacts such as droughts, king tides and sea level rides in terms of access to freshwater. Communities will be empowered through the development of island/atoll specific integrated Water Safety Plans, the formation of Community Water Committees and strengthened national water management governance.

313. Environmental impacts associated with the project are minimal due to the nature of the interventions, while social benefits are significant and can provide long-term improvements to the lives of communities in the target areas. The project will also promote inclusion, particularly of women and vulnerable groups.

314. Key considerations in minimising environmental and social impacts during the project are outlined in the ESMF, but include social inclusion and consultation, sediment and erosion control, and health and safety for workers and community. Physical impacts will be primarily associated with construction and installation of equipment, such as rainwater tanks, groundwater wells and pumps. These impacts will be relatively minor and of a temporary nature.

315. The implementation of the ESMF will ensure that impacts are satisfactorily managed. The ESMF identifies a suite of mitigation measures to minimise potential risks and impacts. Monitoring of appropriate indicators will enable assessment of compliance.

316. Furthermore, the project makes provision for a complaint's register along with a two-tiered Grievance Redress Mechanism, appropriate for the project and consistent with the UNDP's Stakeholder Response Mechanism: Overview and Guidance (2014) and World Bank Group Safeguards Policies. The Grievance Redress Mechanism establishes goals and objectives along with eligibility requirements to make a complaint and/or grievance. It has been designed that all parties will act in good faith throughout the process and more importantly, that is will be arbitrary in nature in trying to achieve mutually acceptable resolutions for all parties. The Grievance Redress Mechanism also provides for the covering of costs for legitimate complaints or grievances so as individuals and/or groups are not disadvantaged by bring complaints to the attention of CSO and UNDP. Finally, if complainants remain dissatisfied with the outcomes at the project level, the Grievance Redress Mechanism allows individuals and/or groups to also file a complaint with the Social and Environmental Compliance Unit within the Office of Anticorruption and Integrity within the UNDP or the appropriate RMI legal or judicial authority e.g., the Courts.

Gender Considerations

317. The project has been designed with adequate attention to gender and social inclusion considerations. The influence of Marshallese culture plays a central role in the way of life of the project beneficiaries, regardless of modernization. This provides for the distinct and different roles of men, women, and children in society, and this offers both significant strengths and challenges in relation to gender equality. In terms of how gender equality influences vulnerability to climate change and disasters, there are a range of factors that intersect with gender, such as age, disability status, and location in outer islands and atolls of RMI.

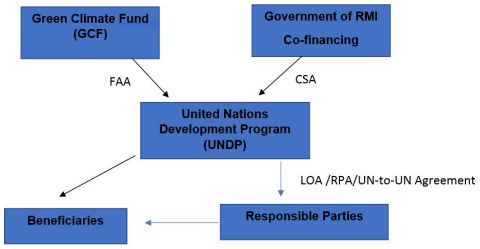
318. The project has been designed to provide key entry points for gender-responsive and socially inclusive actions to be taken in each of its activity areas. These are set out in the annexed gender and social inclusion plan Annex XIIIc and include indicators to measure and track the progress of these actions at the activity level. The action plan links directly into the project log frame, and these two documents should be read together. A Gender and Youth Specialist

will be engaged during implementation to build the capacity of project staff and stakeholders for gender mainstreaming and monitoring and assist with implementation as needed.

F.4. Financial Management and Procurement

319. The financial management and procurement of this project will be subject to UNDP financial rules and regulations available here: here. Further guidance is outlined in the financial resources management section of the UNDP Programme and Operations Policies and Procedures available at here . UNDP has comprehensive procurement policies in place as outlined in the 'Contracts and Procurement' section of UNDP's Programme and Operations Policies and Procedures (POPP). The policies outline formal procurement standards and guidelines across each phase of the procurement process, and they apply to all procurements in UNDP. See here: https://popp.undp.org/SitePages/POPPSubject.aspx?SBJID=211&Menu=BusinessUnit

320. The project will be implemented following the Direct Implementation Modality (DIM) following UNDP POPP available here: https://popp.undp.org/_layouts/15/WopiFrame.aspx?sourcedoc=/UNDP_POPP_DOCUMENT_LIBRARY/Public/FRM_Financial%20Management%20and%20Implementation%20Modality_Direct%20Implementation%20(DIM)%20Modality.docx&action=default&DefaultItemOpen=1 . For project activities carried out by the government as a Responsible Party, fund transfer to the government shall follow DIM guidelines. Funds will flow from GCF via UNDP as shown below:



321. The GCF grant will be managed directly by UNDP through the Direct Implementation Modality arrangement. The co-financing from RMI will also be managed by UNDP through a Cost-Sharing Agreement. The contractual arrangements and funds flow (Fig. C7.1) will ensure seamless implementation of the project with respect to procurement, transport and installation of rainwater harvesting and storage systems that will simultaneously meet water requirements for baseline and climate-induced droughts. Part of the funds may be coursed through responsible parties using the appropriate instrument: Letters of Agreement for government entities; Responsible Party Agreement for non-government organizations; UN-to-UN Agreement for IOM. Activities that will benefit the communities may also be implemented directly by UNDP through the PMU.

322. UNDP will ascertain the national capacities of the implementing partner by undertaking an evaluation of capacity following the Framework for Cash Transfers to Implementing Partners (part of the Harmonized Approach to Cash Transfers - HACT). All projects will be audited following the UNDP financial rules and regulations noted above and applicable audit guidelines and policies.

323. During implementation, UNDP will provide oversight and quality assurance in accordance with its policies and procedures, and any specific requirements in the Accreditation Master Agreement (AMA) and project confirmation to be agreed with the GCF. This may include, but not limited to, monitoring missions, spot checks, facilitation and participation in project board meetings, quarterly progress and annual implementation reviews, and audits at project level on the resources received from UNDP.

324. The project will be audited in accordance with UNDP policies and procedures on audits, informed by and together with any specific requirements agreed in the AMA. According to the current audit policies, UNDP will be appointing the auditors. In UNDP scheduled audits are performed during the project cycle as per UNDP assurance/audit plans, on the basis of UNDP's guidelines. A scheduled audit is used to determine whether the funds were used for the

appropriate purpose and in accordance with the work plan. A scheduled audit can consist of a financial audit or an internal control audit.

325. UNDP provides a variety of assurance activities which will comprise of (but not be limited to):

- Periodic on-site reviews (spot checks) of the financial records of the project. These may be performed by qualified UNDP staff or third party service providers;
- Programmatic monitoring of activities, which provides evidence regarding the status of project implementation and use of the GCF resources; and
- Scheduled and special audits (financial or internal control) of the financial records. UNDP prepares and reports financial statements in full accordance with the International Public Sector Accounting Standards (IPSAS). Full compliance with IPSAS was achieved effective January 2012. IPSAS was mandated by General Assembly Resolution 60/283 and is considered best practice in accounting for public sector and not-for-profit organizations.

326. A draft procurement plan (which will be further discussed and revised prior to UNDP Project Document signature) is provided in Annex XIIIa.

G.1. Risk Assessment Summary

327. A variety of risk factors that have been considered during the project development phase, many of which are magnified by RMI being a SIDS, including: remoteness of project country, remoteness and geographic dispersion of project sites, limited qualified/experienced local staff; and exposure to extreme weather events; and well as more generic environmental and social project risks.

328. The Environmental and Social Risk Assessment discussed earlier has highlighted risks associated with the impact of the project on the environment and communities. In addition, there are risks to the project implementation itself. These need careful evaluation, monitoring and mitigation due to the inherent vulnerabilities of Small Island Developing States.

329. Risk factors associated with the project implementation include mainly technical and operational, institutional, and social and environmental aspects (please refer to section F.3 for ESS assessment). The risks related to technical and operational capacities may affect design and installation of the RWH systems, storage and well protection infrastructure. Risks related to inadequate operation and maintenance of the water supply solutions can impede sustained water supply. Other risks could be related to operational issues of delays in completion of the infrastructure or availability of sufficiently trained personnel to complete the installations. Risks related to limited coordination amongst agencies and stakeholders can lead to inefficiencies in the implementation and impact of the project interventions. Risks related to limited awareness and preparation of communities can impede adoption of the technologies, practices, and information advanced through the project. Climate shocks can lead to a risk of damage to the project investments affecting implementation as well as sustained impact post-project. Finally, there are environmental and social risks related to sediment control, noise, etc. that could affect communities targeted in the project. These are detailed in Section F.3 as well as added in the table below.

330. The proposed project includes several mitigation measures to address these risks. The project will invest in local level mobilisation and technical capacity building for communities and officials to ensure adequate design and implementation of project solutions. Project will implement tested O&M models for community management with clear guidelines and delineation of responsibilities at the outset and focus on building technical and financial capacity for sustained O&M. Developing SOPs for maintenance and data sharing for EPA and NDMO will ensure that reliable water resource management information received by both the government and the community. A sound implementation and project management framework will be established to overcome challenges of inter-sectoral coordination. The project will continue engage and build capacity for various stakeholders at national level and sub-national level. The project support to coordinated planning and investments through integrated water management plans, SOPs, etc. will also build the capacity and mechanisms for sustained institutional coordination. The risk of low commitment to and adoption of project solutions is mitigated through inclusive multi-stakeholder consultative approach to project design and implementation, investments in sensitization and capacity building, implementation of community-based management models for project investments, and support to financial viability and sustainability of the solutions. Impact of climate shocks is mitigated through use of reliable forecasts for planning and operation of the infrastructure as well as incorporating design elements to increase the resilience of the investments to extreme events. Finally, detailed ESMP plan (See Annex VI) is established to address environmental and social risks arising from the project.

331. In summary, a variety of risks have been identified for the project. Project risks have been assessed and are considered to be mainly low or moderate. The proposed project builds on the successes of earlier projects and benefits from the lessons learned from previous efforts. This, coupled with mitigation measures developed to minimise risks, will ensure that risks are managed to an acceptable level.

332. In addition, the project has been formulated based on consultations at national and municipal level, and project design has been reviewed by stakeholders at all levels, including a sample of community representatives, creating buy-in.

G.2. Risk Factors and Mitigation Measures

333. As noted above, a range of risks have been identified for the project. The following table identifies some of the key risks and mitigation measures designed to minimise them.

Selected Risk Factor 1	**Project Management and Procurement**		
Description	Risk category	Level of impact	Probability of risk occurring
International supply chains are long, expensive and prone to shipping delays. Country staff have little/negligible experience of international procurement procedures	Technical and operational	High (>20% of project value)	Medium
Mitigation Measure(s)			
The international logistical and procurement issues will be mitigated through a combination of the provision of appropriate logistics and procurement support by UNDP staff (under DIM) to ensure supply chains and times are well understood, delivery contingency plans are prepared, and detailed procurement tasks and timeframes are incorporated and integrated into the project work plans. Risks can be further mitigated through use of carefully prepared pre-qualification criteria for suppliers, requiring demonstrable international experience of trans-Pacific Ocean product and material delivery and incentivizing suppliers to use reputable shipping agents, as well as scheduling deliveries to coincide with more convenient times of year (away from holiday periods and monsoon seasons).			
Selected Risk Factor 2	**Remoteness of Sites**		
Description	Risk category	Level of impact	Probability of risk occurring
The project sites are located across separate atolls/islands, dependent on inter-island transport. Transport delays could delay implementation.	Technical and operational	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			
The national logistical and access issues will be mitigated through a combination of ensuring the PMU has adequate access to national logistics expertise, the use of contingency planning, integration of logistical tasks and timeframes into the work plan and sympathetic scheduling of shipment arrivals.			
Selected Risk Factor 3	**Limited Qualified Staff**		
Description	Risk category	Level of impact	Probability of risk occurring
Limited in-country technical, managerial and procurement expertise in critical project areas Inappropriate or inadequate delegates at training workshops Conflicting demands on key governmental and non-governmental staff	Technical and operational	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			

The risk relates across the project stakeholder groups, including governmental departments, non-governmental organisations– and reflects the limited on-island population size and exposure to alternative approaches other than business-as-usual.

The risks will be mitigated through the following actions:

- Adoption of DIM, with the RMI team being supported by UNDP Pacific Office in Fiji
- Careful selection and deployment of appropriately experienced international technical advisors to support knowledge transfer; the Project Manager is intended to be internationally-recruited
- Early political advocacy and public awareness raising to ensure ministerial, institutional and community support to project objectives
- Careful pre-selection and vetting of training opportunities nominees
- Use of Training-the-Trainer approaches to increase capacity outreach
- Backstopping and buddying of local staff with national and international experts
- Careful monitoring and assessment of project delivery
- Development of locally delivered and institutionalised training programmes

Adopting and monitoring the success of these approaches is expected to reduce the residual risk to low.

Selected Risk Factor 4 Extreme Weather

Description	Risk category	Level of impact	Probability of risk occurring
Extreme weather events restrict transportation and infrastructure construction activity periods and delay/limit inter-island access. Natural hazards damage and/or destroy pre-existing and or project activities, and create short-term response & recovery priorities for government and communities.	Social and environmental	High (>20% of project value)	Low

Mitigation Measure(s)

Logistics to take into consideration optimal weather periods for shipping and construction. The capital expenditures will be spread over 3 years to allow for adjustments due to weather disturbances.

Design to incorporate likely weather conditions such that infrastructure can withstand extreme events.

Scheduling to consider both weather risk (storm season) during implementation as well as early implementation of activities that can reduce risk of existing infrastructure being damaged eg early protection of groundwater wells may reduce likelihood of inundation.

Selected Risk Factor 5 Community Ownership

Description	Risk category	Level of impact	Probability of risk occurring
Communities not committed to effort required to strengthen capacity in adaptive management, preferring government hand-outs and infrastructure gifts.	Social and environmental	Medium (5.1-20% of project value)	Medium

Mitigation Measure(s)

The household RWH systems directly benefits households while community systems are shared. It is expected that full cooperation will be provided by all beneficiaries.
Early scheduling of public awareness campaigns to reach urban and rural population
Community involvement in simple construction tasks and training/upskilling on more complex tasks.

The residual risk can be reduced to low with careful and sustained engagement and communication with direct and indirect beneficiary communities.

Selected Risk Factor 6 Political Interference

Description	Risk category	Level of impact	Probability of risk occurring
Senior national, island and community political key stakeholders distracted by other priorities, projects and parliamentary cycles as well as shock events. Disengagement or hostility to project.	Other	High (>20% of project value)	Low

Mitigation Measure(s)

Careful engagement with senior government representatives during the project design process.
Transparent and accountable target community selection not influenced by local political preferences.
Transparent and accountable project delivery decisions.
Strong communication with government through well established and respected UNDP CO staff.
Recognition of parliament annual cycle and necessity of timely inputs to governmental decision making bodies.

Selected Risk Factor 7 Inter-agency Coordination

Description	Risk category	Level of impact	Probability of risk occurring
Limited coordination between government ministries, UNDP, communities, NGOs/CBOs, private sector and other stakeholders reduces the efficiency and effectiveness of implementation of project interventions.	Technical and operational	Low (<5% of project value)	Medium

Mitigation Measure(s)

Strong institutional and implementation arrangements for the project's management framework will ensure effective coordination and collaboration between project partners.
Project management units at the national level will facilitate constant dialogue between project partners and stakeholders. This will be complemented by UNDP's role as executing agency responsible for project oversight. In addition, co-management structures will promote coordination and collaboration between government officials and local communities for on-the-ground activities. The project will also build institutional capacities for coordination between various stakeholders.
Moreover, project activities focus specifically on building capacities in various institutions.
This mitigation measure is expected to adjust the risk level to "Low".

Selected Risk Factor 8 Environmental Impacts

Description	Risk category	Level of impact	Probability of risk occurring
Project activities result in collateral environmental degradation.	Social and environmental	Low (<5% of project value)	Low

Mitigation Measure(s)

An Environmental and Social Management Framework has been prepared for the project. The ESMF considers environmental and social risks and outlines mechanisms for management and monitoring of potential risks. The ESMF applies to all aspects of the project.

Stakeholders are further empowered to take action in the event of collateral damage through the project Grievance Redress Mechanism, which is outlined in the ESMF.

Selected Risk Factor 9 Inequitable Representation

Description	Risk category	Level of impact	Probability of risk occurring
Limited involvement and participation of women and other marginalized groups in project implementation.	Social and environmental	Low (<5% of project value)	Low

Mitigation Measure(s)

The project has a strong focus on inclusion of women and socially marginalized groups within the planning and implementation of project activities. This inclusion began during the design of this project proposal, with numerous consultations targeting women and members of other vulnerable groups, including young people. During project implementation, this consultation process will continue to guide implementation of project activities, with certain activities targeting women and other vulnerable groups as the primary beneficiaries, and youth training opportunities being open to youth from all social backgrounds.
Furthermore, the ESMF outlines a Grievance Redress Mechanism that will be in place to enable any aggrieved stakeholder to utilise.

Other Potential Risks in the Horizon

H.1. Logic Framework.

Please specify the logic framework in accordance with the GCF's Performance Measurement Framework under the Results Management Framework.

H.1.1. Paradigm Shift Objectives and Impacts at the Fund level[54]

Paradigm shift objectives	
Increased climate-resilient sustainable development	Addressing Climate Vulnerabilities in the Water Sector (ACWA) in the Marshall Islands
Increased climate resilient sustainable development	The proposed project contributes to climate-resilient water resources development in RMI through the sustained impact of project measures. Overall, the project will contribute to the Fund level impact of Increased resilience of health and wellbeing, and food and water security. GCF funding will support an integrated approach to strengthening the water sector resilience in RMI through three inter-related outputs contributing to climate resilient water management. The interventions will directly benefit approximately 15,572 people across the 24 inhabitated atolls and indirectly benefit the entire population of RMI (55,226 people) through capacity building and integration of water management into national governance framework. The proposed interventions aim to increase resilience of water resources for drinking and hygiene purposes in RMI. This will be done by: • Improving household and community rainwater harvesting and storage structures to increase resilience of water supply in all outer islands and atolls accounting for approximately 28% of RMI's population, including 7,630 (49%) women, currently at risk • Securing groundwater resources from contamination due to inundation caused by wave overtopping of seawater. • Strengthening the technical capacities of national and subnational institutions and key stakeholders to integrated climate change risks into water governance processes so that management of climate change risks are coordinated, effective, participatory, equitable, and sustained over the long-term when risks are expected to worsen. These components of the proposed project contribute to mainstream climate change adaptation into national planning and development, as envisaged under the RMI Water and Sanitation Policy and Action Plan (NEPA Amendment 2016) and other key climate change policies and strategies of the Government of RMI to enable climate change adaptation.

Expected Result	**Indicator**	**Means of Verification (MoV)**	**Baseline**	**Target**		**Assumptions**
				Mid-term (if applicable)	Final	
Fund-level impacts						
A2.0 Increased resilience of health and well-being, and food and water security	A2.1 Number of males and females benefiting from improved health due to safe drinking water supply despite climate shocks and stresses	Project baseline, mid-term and end term surveys.	<5% of population	50% of population in targeted communities (50 per cent of the beneficiary population	100% target population with access to safe	No major disaster occurs in the project locations that may delay the completion of the water infrastructure work.

[54] Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf

	A2.2 Number of males and females with year-round access to reliable water supply during prolonged drought.	As above	As above	to be women; 25 per cent of all beneficiaries to be youth) As above	drinking water (50 per cent of the beneficiary population to be women; 25 per cent of all beneficiaries to be youth)	Households and communities are properly trained in the use and maintenance of water infrastructure.

A3.0 Increased resilience of intrastructure and the built environment to climate change	3.1 Value of infrastructure made more resilient to rapid-onset events (e.g. floods, storm surges, heatwaves) and slow-onset processes (e.g. sea level rise)	Project baseline, mid-term and end term surveys.	None	1293 households and 79 community buildings made resilient[55]	2586 households and158 community buildings made resilient	
	3.2 Number of new infrastructure projects or physical assets strengthened or constructed to withstand conditions resulting from climate variability and change	Sustained operation and maintenance created through the Project	None	79 buildings improved and 60 new community RWH systems installed	RWH systems on 158 community buildings improved and 121 new community RWH systems installed	

[55] Households will be able to have sufficient water supply for 90% of the projected droughts based on RCP 8.5 models

H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
Project/programme Outcomes	**Outcomes that contribute to Fund-level impacts**					
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	*7:1: % of vulnerable households in targeted communities with improved access to water, and strategies to respond to climate variability in the outer atolls and islands of RMI*	Project baseline, mid-term and end term surveys Gender sensitive field surveys in the 23 local government jurisdictions	0	50% of households in targeted communities have upgraded or new RWH and storage (the project will target 49% female headed households)	100% people, of households in targeted communities (the project will target 49% female headed households)	Infrastructure, adapted rural life activities and climate services are completed and implemented successfully in the 23 local government jurisdictions
Project/programme outputs	**Outputs that contribute to outcomes**					
Output 1: Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI	1.1 Extent of improvements in existing rainwater harvesting systems for existing HH and community buildings in outer islands and atolls	Number of households, and community buildings with upgraded existing rooftop rainwater harvesting systems (surveys collected through CWCs)	11,302 m^3 of water required to achieve the baseline drought, and an additional 9,161 m^3 of climate change induced drought periods	1265 households RWH upgrades, 79 community buildings installed.	Upgrading of RWH for 2,529 households and 158 community buildings (the project will target 49% female headed households)	No major disaster occurs in the project locations that may delay the implementation of water infrastructure at household and community level. Sufficient rainfall can be collected to help achieve water security.

	1.2 Additional (new) rainwater harvesting and storage systems for communities in outer islands and atolls	Number of community buildings with improved efficiency of rainwater harvesting systems and increased storage capacity (surveys collected through CWCs)	0	60 new community roof/storage systems	121 new community roof/storage systems installed	Government and local authorities are willing to adjust existing planning instruments
Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall	2.1 Number of protect groundwater wells from more frequent storm surges and contamination 2.2 Strengthened local capacities and enhanced women and youth's leadership through best practices	Project baseline, mid-term and end term surveys, Mid-term review and terminal evaluation Project baseline, mid-term and end term reviews, that includes results from assessment and monitoring systems created by the Project	2,586 households and community groundwater wells open to contamination by seawater 0	50% groundwater wells protec >50% of training participants who have adopted the best practices (disaggregated by gender)	100% target wells households and community groundwater wells will be protected from storm surges and contamination in 77 target rural communities 100% of training participants who have adopted the best practices (disaggregated by gender)	No major disaster occurs in the project locations that may delay the implementation of groundwater wells protection at household and community level Sufficient interest and participation from community partners on training opportunities and workshops

	on reduced demand for rainwater					
Output 3: Climate change induced drought preparedness and response measures implemented in outer atolls and islands implemented in outer atolls and islands	3.1 Updated national-level contingency plans and national-level water safety plans, and develop Standard Operating Procedures (SOPs) for climate change induced drought response 3.2 Number of developed and implemented community-level drought contingency planning in outer islands and atolls	Project baseline, mid-term and end term surveys, Mid-term review and terminal evaluation SOP developed and applied by local authorities with alert times that compare with international best practices Number of Community Water Committees	0 0 0	Trained CWCs have adopted contigency plans	100% of training CWCs who have adopted the contingency plans and SOPs 77 community-based water committee (CWCs) with enhanced capacities to develop, implement, operate, maintain and monitor drought SOPs	Sufficient local capacities exist with the relevant authorities to uptake additional mechanisms Willingness of communities and local partners to absorb knowledge specific to operation and maintenance of rainwater harvesting tanks.
Activities	**Description**		**Inputs**		**Description**	
Activity 1.1 Improve existing rainwater harvesting systems for community buildings and households in outer islands and atolls for usage during increasing frequency and periods of drought	GCF funds will be used to improve existing rainwater harvesting systems for 147 community buildings and 2,400 households across the 24 local government jurisdictions. An additional 11,302 m^3 of water will be provided to achieve the baseline drought, as well as 9,161 m3 of water to meet the climate change induced drought.		1.1.1. Improve existing rainwater harvesting systems for community buildings and households (HH) in the outer atolls and islands (the project will target 49% female headed households) 1.1.2 Improve existing rainwater harvesting systems for community buildings (CB) and increase storage capacity in the outer atolls and islands.		1.1.1 The activity will close the water gap by improving existing rainwater harvesting systems for community buildings and households and ensuring that 100% of the roofs are connected to rainwater harvesting systems, improving household systems to 70% of efficiency. Moreover, guttering systems will be replaced with 150mm gutters, and downpipes will be replaced with 150mm downpipes. 1.1.2 The activity will improve existing rainwater harvesting systems for community buildings and will install first flush diverter and insect screens, as well as will improve the efficiency of rainwater harvesting systems to 80%.	

Activity 1.2 Provide additional rainwater harvesting systems and increase of storage capacity for communities in outer islands and atolls for usage during increasing frequency and periods of drought	This activity will improve the efficiency of rainwater harvesting at existing community buildings by upgrading community level storage quality and capacity, and by installing an additional of 50m³ of storage capacity for each community building, improving the RWH system efficiency at 80%. The project ESMF, as it applies to Output 1, will be implemented and audited, including the monitoring of impacts.	1.2.1. Build new roof catchment systems 1.2.2. Build new storage tanks	This activity will transform existing community building catchment systems to 100% utilization and will implement new storage capacity of 50m³ per community tanks. Additional roof systems will be constructed to meet the community water demand and close the water gap.
Activity 2.1. Protect groundwater wells from more frequent climate change induced storm surges and contaminations	A total of 2,586 priority households and community groundwater wells in 78 targeted rural communities will be protected from contamination from debris, sea swells and high tides, by lining the well for the full depth and to at least 0.6m above the ground.	2.1.1. Provide community water solutions for water vulnerable populations 2.1.2. Adaptation of existing water infrastructure solutions in the region	Groundwater wells will be covered against king tides and storm surges. Water access will be facilitated through the provision of fitted hand pumps. Existing water infrastructure will be climate proofed by raising the height of groundwater wells, and extending the surface concrete slab to 2m.
Activity 2.2. Enhance women and youth's leadership through best practices and community awareness programmes on efficient usage (demand management) of rainwater	Documentation of water demand reduction options and best practices on efficient water management for women and youth will be promoted through the provision of formal and informal trainings on water management. Exchange visits will be facilitated in the 23 atolls and islands of RMI, and certification programmes in the University of South Pacific will be secured for the best contestant.	2.2.1 Facilitate inter-island knowledge exchange visits with women and youth, sharing experience and practice on water conservation 2.2.2 Certification programme for women and youth focused on climate change adaptation and disaster risk reduction	A local university (USP) will provide formal and informal education to vulnerable women and youth on climate change adaptation and water demand management. Empowerment of and support to women-led and related associations to lead the restoration process to ensure sustainability of the restoration process. Lessons learned will be exchanged through use of 'model villages', formal structures (CWCs, local and national government) and community/NGO networks.
Activity 3.1. Updated national-level contingency plans and national-level water safety plans, and develop Standard Operating Procedures (SOPs) for climate change induced drought response	To support the Office of the Chief Secretary (OCS), the National Disaster Management Office (NDMO), and other national partners, national-level contingency plans and national-level water safety plans will be updated, and standard operating procedures (SOPs) for drought response will be developed. The SOPs will indicate the actions involved in responding to drought and the necessary measured for preparedness, response and relief. Training programs for drought management and contingency planning	3.1.1. Conduct training programs for drought risk management, water-safety and contingency planning at institutional level 3.1.2. Implement SOPs for drought preparedness and response	Training programmes will equip government officials with the required skills and knowledge to develop and activate contingency plans. Moreover, training programmes will enable participants to understand risk analysis, vulnerability and capacity assessment, resource mobilization and other. National-level drought contingency plans, water safety plans and SOPs

	at institutional level will take place, ensuring the NDMO and relevant partners are prepared to respond to anticipated droughts with the needed systems and tools in place.		will be developed, including drought scenarios, technical audit and improved internal management systems, communications, resource mobilization etc. Through testing and simulation, the SOPs developed for drought will be tested.
Activity 3.2. Develop and implement community-level drought contingency planning in outer islands and atolls	Capacity building programme for drought risk management and contingency planning will be provided to Community-based Water Committees (CWCs). An assessment of existing and potential water supply during period of drought will be undertaken, and based on the findings, targets for reduced consumption and priority of use will be developed through contingency plans. Trainings will also include operation and maintenance of community water storage and community wells as well as any other water infrastructure provided through this project. Moreover, trainings will include water balance assessments and access plans for community water resources.	3.1.3. Training for community-based water committees and local government representatives 3.1.4. Training community members in operation and maintenance of rainwater harvesting systems (aiming for 50 per cent women and 25 per cent youth beneficiaries) 3.1.5. SOPs for drought contingency planning for rural communities and local government	Technical assistance to community-based water committees will be provided to develop drought contingency plans, and SOPs for drought early warning and response. Capacity building will be focused on operation and maintenance of water infrastructure provided through this project, with a focus on women and youth.

H.2. Arrangements for Monitoring, Reporting and Evaluation

334. The project results as outlined in the project results framework will be monitored and reported annually and evaluated periodically during project implementation to ensure the project effectively achieves these results.

335. Project-level monitoring and evaluation will be undertaken in compliance with the UNDP POPP and the UNDP Evaluation Policy.

336. The primary responsibility for day-to-day project monitoring and implementation rests with the Project Manager. The Project Manager will develop annual work plans to ensure the efficient implementation of the project. The Project Manager will inform the Project Board and the UNDP Pacific Office of any delays or difficulties during implementation, including the implementation of the Monitoring & Evaluation (M&E) plan, so that the appropriate support and corrective measures can be adopted. The Project Manager will also ensure that all project staff maintain a high level of transparency, responsibility and accountability in monitoring and reporting project results.

337. The UNDP Pacific Office in Fiji will support the Project Manager as needed, including through annual supervision missions. The UNDP Pacific Office is responsible for complying with UNDP project-level M&E requirements as outlined in the UNDP POPP. Additional M&E, implementation quality assurance, and troubleshooting support will be provided by the UNDP Regional Technical Advisor as needed. The project target groups and stakeholders including the NDA Focal Point will be involved as much as possible in project-level M&E.

338. A project inception workshop will be held after the UNDP project document has been signed by all relevant parties to: a) re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation; b) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms; c) review the results framework, re-assess baselines as needed, and discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E plan; d) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; e) plan and schedule Project Board meetings and finalize the first year annual work plan. The Project Manager will prepare the inception report no later than one month after the inception workshop. The final inception report will

be cleared by the UNDP Pacific Office and the UNDP Regional Technical Adviser, and will be approved by the Project Board.

339. A project implementation report will be prepared for each year of project implementation. The Project Manager, the UNDP Pacific Office, and the UNDP Regional Technical Advisor will provide objective input to the annual PIR. The Project Manager will ensure that the indicators included in the project results framework are monitored annually well in advance of the PIR submission deadline and will objectively report progress in the Development Objective tab of the PIR. The annual PIR will be shared with the Project Board and other stakeholders. The UNDP Pacific Office will coordinate the input of the NDA Focal Point and other stakeholders to the PIR. The quality rating of the previous year's PIR will be used to inform the preparation of the next PIR. The final project PIR, along with the terminal evaluation report and corresponding management response, will serve as the final project report package.

340. An independent mid-term review process will be undertaken and the findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the final MTR report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. The final MTR report will be cleared by the UNDP Pacific Office and the UNDP Regional Technical Adviser, and will be approved by the Project Board. The final MTR report will be available in English. An independent terminal evaluation (TE) will take place no later than three months prior to operational closure of the project. The terms of reference, the review process and the final TE report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. The final TE report will be cleared by the UNDP Pacific Office and the UNDP Regional Technical Adviser, and will be approved by the Project Board. The TE report will be available in English. The UNDP Pacific Office will include the planned project terminal evaluation in the UNDP Country Office evaluation plan, and will upload the final terminal evaluation report in English and the management response to the public UNDP Evaluation Resource Centre (ERC) (www.erc.undp.org). The MTR and TE will be carried out by an independent evaluator. The evaluation report prepared by the independent evaluator is then quality assessed and rated by the UNDP Independent Evaluation Office.

341. The UNDP Pacific Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations. A detailed M&E budget, monitoring plan and evaluation plan will be included in the UNDP project document.

342. UNDP will perform monitoring and reporting throughout the Reporting Period, including semi-annual reporting, in accordance with the AMA and Funded Activity Agreement (FAA). UNDP has country presence (through the shared UN Field Office in Majuro) and capacity to perform such functions. In the event of any additional post-implementation obligations over and above the AMA, UNDP will discuss and agree these with the GCF Secretariat in in the final year of the project and will prepare a post-implementation monitoring plan and budget for approval by the GCF Board as necessary.

I. SUPPORTING DOCUMENTS FOR FUNDING PROPOSAL

☒ NDA No-objection Letter **(Annex I)**

☒ Feasibility Study **(Annex II)**

☐ Integrated Financial Model that provides sensitivity analysis of critical elements **(Annex III) – Not Applicable**

☒ Confirmation letter or letter of commitment for co-financing commitment **(Annex IV)**

☒ Project/Programme Confirmation/Term Sheet (including cost/budget breakdown, disbursement schedule, etc.) – *see the Accreditation Master Agreement, Annex I* **(Annex V)**

☒ Environmental and Social Impact Assessment/Social and Environmental Screening Template **(Annex VIa)**

☒ Environmental and Social Management Framework (ESMF) **(Annex VIb)**

☒ Appraisal Report or Due Diligence Report with recommendations **(Annex VII)**

☐ Evaluation Report of the baseline project **(Annex VIII) – Not Applicable**

☒ Map indicating the location of the project/programme **(Annex IX)**

Additional information

☒ Timetable of project/programme implementation **(Annex X)**

☒ Project/ programme confirmation **(Annex XI)**

☒ Economic analysis (**Summary; Annex XIIa**)

☒ Economic analysis (**Excel calculations; Annex XIIb**)

☒ Procurement plan **(Annex XIIIa)**

☒ Operations and Maintenance Plan **(Annex XIIIb)**

☒ Gender Assessment and Action Plan **(Annex XIIIc)**

☒ Stakeholder Consultation Report **(Annex XIIId-1)**

☒ Stakeholder Engagement Plan **(Annex XIIId-2)**

☒ Detailed budget and work plan **(Annex XIIIe)**

☒ HACT Assessment **(Annex XIIIf)- Not Applicable for DIM**

☒ Project activities and responsibilities **(Annex XIIIg)**

☒ Any other relevant document for submission (Official request for DIM from RMI Gov)-**Annex XIIIh**

☒ Any other relevant document for submission (GCF AE Fee Request)-**Annex XIIIi**

☒ Response to GCF Comments on Proposal **(Annex XIV)**

☒ UNDP Endorsement Letter **(Annex XV)**

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

No-objection letter issued by the national designated authority(ies) or focal point(s)

REPUBLIC OF THE MARSHALL ISLANDS
Office of Environmental Planning & Policy Coordination
P.O. Box 975
Majuro, Marshall Islands 96960
Phone No: (692) 625-7944/7945
Skype: clarence.samuel E-mail: clarencesam@gmail.com

June 11, 2018 Ref: MI18-007

Mr. Howard Bamsey
Executive Director, GCF
Songdo Business District
175 Art center-daero
Yeonsu-gu, Incheon 22004
Republic of South Korea

Dear Mr. Bamsey,

Funding proposal for the GCF by the United Nations Development Program ("UNDP")
Regarding "Addressing Climate Vulnerabilities in the Water Sector ("ACWA")
in the Republic of the Marshall Islands ("RMI")

We refer to the project "Addressing Climate Vulnerabilities in the Water Sector (ACWA) in the Republic of the Marshall Islands as included in the funding proposal submitted by the United Nations Development Program to us on March 22, 2018.

The undersigned is the National Designated Authority/Focal Point of the Republic of Marshall Islands. Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, hereby communicate our no-objection to the project as included in the funding proposal. By communicating our no-objection, it is implied that:

a. The Government of the Republic of Marshall Islands has no-objection to the project as included in the funding proposal;
b. The project, as included in the funding proposal, is in conformity with RMI's national priorities, strategies and plans; and,
c. In accordance with the GCF's environmental and social safeguards, the project, as included in the funding proposal, is in conformity with relevant national laws and regulations.

We confirm that our national process for ascertaining no-objection to the project, as included in the funding proposal, has been duly followed. We also acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,

Clarence Samuel
Director, OEPPC
RMI GCF NDA

Environmental and social safeguards report form pursuant to para. 17 of the IDP

Basic project or programme information	
Project or programme title	Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands
Existence of subproject(s) to be identified after GCF Board approval	No
Sector (public or private)	Public
Accredited entity	United Nations Development Programme (UNDP)
Environmental and social safeguards (ESS) category	Category B
Location – specific location(s) of project or target country or location(s) of programme	24 tolls and islands in the Republic of Marshall Islands (RMI): Ailinglaplap, Ailuk, Arno, Aur, Ebon, Enewetak, Jabat, Jaluit, Kili, Kwajalein, Lae, Lib, Likiep, Majuro, Maloelap, Mejit, Mili, Namdrik, Namu, Rongelap, Ujae, Utrik, Wotho, Wotje
Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity's website	Tuesday, April 9, 2019
Language(s) of disclosure	English
Explanation on language	RMI has two official languages, Marshallese and English
Link to disclosure	http://www.pacific.undp.org/content/pacific/en/home/library/rsd/rmi-environmental-social-management-plan.html
Other link(s)	N/A
Remarks	A simplified ESIA consistent with the requirements for a Category B project is contained in the Environmental and Social Management Plan
Environmental and Social Management Plan (ESMP) (if applicable)	
Date of disclosure on accredited entity's website	Tuesday, April 9, 2019
Language(s) of disclosure	English
Explanation on language	RMI has two official languages, Marshallese and English
Link to disclosure	http://www.pacific.undp.org/content/pacific/en/home/library/rsd/rmi-environmental-social-management-plan.html
Other link(s)	N/A

Remarks	An ESMP consistent with the requirements for a category B project is contained in the Environmental and Social Management Plan
Environmental and Social Management (ESMS) (if applicable)	
Date of disclosure on accredited entity's website	N/A
Language(s) of disclosure	[__]
Explanation on language	[__]
Link to disclosure	[__]
Other link(s)	[__]
Remarks	[__]
Any other relevant ESS reports, e.g. Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF), Indigenous Peoples Plan (IPP), IPP Framework (if applicable)	
Description of report/disclosure on accredited entity's website	Social and Environmental Screening Template Tuesday, April 9, 2019
Language(s) of disclosure	English
Explanation on language	RMI has two official languages, Marshallese and English
Link to disclosure	http://www.pacific.undp.org/content/pacific/en/home/library/rsd/rmi-environmental-social-management-plan.html
Other link(s)	N/A
Remarks	
Disclosure in locations convenient to affected peoples (stakeholders)	
Date	Tuesday, April 9, 2019
Place	UNDP Website
Date of Board meeting in which the FP is intended to be considered	
Date of accredited entity's Board meeting	N/A
Date of GCF's Board meeting	Saturday, July 6, 2019

Note: This form was prepared by the accredited entity stated above.

Secretariat's assessment of FP112

Proposal name:	Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands
Accredited entity:	United Nations Development Programme (UNDP)
Country/(ies):	The Marshall Islands
Project/programme size:	Small

I. Overall assessment of the Secretariat

1. The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
Clear climate rationale: existential threat to habitability of the nation's outer islands due to sea level rise (which increases the risk of overtopping events that destroy the islands' freshwater aquifer lenses) and lengthening droughts that will exhaust the islands' present rainwater storage capacity.	The project operation and maintenance costs may be relatively low compared with other technologies (such as desalination) but affordability will still be a challenge. The Government of the Marshall Islands has committed to cover periodic operation and maintenance costs beyond the life of the project.
The project's direct beneficiaries (15,572 people, 49% female) represent 28% of the country's total population.	The water supply infrastructure on the outer islands has become derelict due to lack of maintenance. The project must seek to understand why this has happened and incentivize users to sustain the new rainwater harvesting systems.
Rainwater harvesting systems are a robust technology and relatively simple to operate.	The project is coordinated with the Marshall Islands' National Water and Sanitation Policy, but does not directly address sanitation, although it is linked to other donor-funded initiatives that are directly supporting improvements in sanitation.
Country ownership is high, and well aligned with national priorities.	Per beneficiary cost (USD 1,227 per direct beneficiary from GCF funds) is high, but not unusually so for a Small Island Developing State.
The capacity of the community water committees to sustain the rainwater harvesting systems will be enhanced.	The economic returns of the project are relatively low.

2. The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum XIII, titled "List of proposed conditions and recommendations".

II. Summary of the Secretariat's assessment

2.1 Project background

3. The project supports the Government of the Marshall Islands in its efforts to adapt to increasing climate risks, including more frequent and extreme droughts, and sea level rise increasing the risk of wave overtopping events, which impact the country's drinking water supply stored largely in freshwater aquifers (i.e. groundwater).

4. The Marshall Islands is particularly vulnerable to climate change. Its climate is influenced by large ocean-atmosphere interactions, such as trade winds, monsoons and tropical cyclones. Further, its populations and infrastructure are concentrated in small, low-lying islands and atolls (the largest of which is only 16 square kilometres) so that any rise in sea level, changes in weather patterns or extreme events have significant and profound effects on settlements, living conditions and the economy.

5. The hydro-geophysical features of the country significantly contribute to its high vulnerability to natural disasters and climate change. Droughts and storm waves are the main extreme events that impact the Marshall Islands. Historical data show a decreasing trend of rainfall quantities, with a consequential increase in drought risk.

6. Increasing sea level rise and decreasing rainfall characterize the Marshall Islands' vulnerability to climate change in relation to freshwater supply. These climate change impacts are likely to exacerbate the risks of freshwater shortages in the Marshall Islands, challenging the ability of the Marshallese people to have access to safe, fresh water all year round.

7. Options for safe, fresh water are limited. With increasing sea level, tidal heights and storm surges, groundwater quality will be compromised ever more frequently. Desalination units are costly to operate, maintain and deploy. In practice this limits their application (at scale) to more densely populated urban islands, such as Majuro and Ebeye.

8. The primary focus of the project will be the improvement and expansion of rainwater harvesting systems and storage capacity to supply at least 20 litres per person per day in 77 rural communities on 23 of the outer islands and atolls of the Marshall Islands.

9. Rainwater harvesting systems will be improved on 2,529 household buildings, additional storage tanks will be added to 158 existing community buildings and 121 new community rainwater harvesting systems will be constructed. In addition, the project will provide sanitary protection (sidewalls and aprons) to 2,586 water wells, safeguarding water quality in the communities.

2.1.1. Climate objective

Adaptation

10. The Marshall Islands consists of 24 inhabited atolls and islands, which are mostly remote and lie, on average, just 2 metres (m) above sea level.

11. Climate change projections for the Marshall Islands indicate that droughts are to become longer, more severe and more frequent. Existing water sources and insufficient rainwater storage means that the Marshallese will be unable to access sufficient water supplies.

12. Adaptation for human health and well-being, and food and water security: by providing access to a resilient supply of good quality water, this project will directly improve water security and positively impact human health and well-being.

13. Adaptation of infrastructure and built environment: the project provides infrastructure – upgraded rainwater collection and storage tanks, and protected wells – all designed to be fully climate change proof.

Mitigation

14. It is likely that there may be some mitigation benefits to the project, specifically greenhouse gas emissions may be avoided by:

(a) Removing the need to run emergency desalination units during droughts and after storms;

(b) Reducing the need to import water from Majuro/Ebeye to the outer islands/atolls by ship; and

(c) Ensuring that households reduce their need to boil drinking water using kerosene or firewood.

15. However, the accredited entity (AE) has elected not to claim mitigation co-benefits for this project.

2.1.2. Financing information

16. The AE has requested that the project be financed by a USD 18.6 million grant from GCF, which represents approximately 75 per cent of the total cost. Co-finance will be provided by the Government of the Marshall Islands (USD 6.11 million).

17. To meet operating expenditures, the project will require a government water supply subsidy from the eighth year until the twenty-fifth year of operation amounting to USD 13.972 million. The Ministry of Finance has formally committed to allocate this funding.

2.1.3. Environmental and social safeguards

18. The project has been classified by the AE as category C for indigenous peoples and category C for involuntary resettlement. The Marshallese are a single indigenous ethnic group and the project beneficiaries are not considered to be a distinct and vulnerable indigenous people.

19. The project will not have involuntary resettlement impacts. Building owners who wish to participate in the programme will need to allocate a small amount of space to fit new or renovated rainwater tanks.

20. There is a risk of health impacts if the rainwater tanks are not maintained satisfactorily, and mosquitoes can breed in stagnant water. Algae growth also occurs if rainwater tanks are not cleaned regularly. Algae can carry toxins that are harmful to animals, humans and plants. These issues can be addressed through using appropriately designed tanks, and regular cleaning and maintenance, which can be ensured by the community-based water committees.

2.2 Component-by-component analysis

Component 1: Implementation of optimal mix of interventions to ensure climate resilient water security in the outer atolls and islands of the Marshall Islands (total cost: USD 16.77 million; GCF cost: USD 11.21 million, or 66.8 per cent)

21. This component will improve existing rainwater harvesting systems for community buildings and households in the outer islands and atolls to provide water during increasingly frequent periods of drought. It will also build new rainwater harvesting systems on community buildings.

22. The primary focus of the project will be the improvement and expansion of rainwater harvesting systems and storage capacity to an adequate level to supply at least 20 litres per person per day in the rural communities of the outer islands and atolls of the Marshall Islands throughout longer drought events triggered by climate change.

23. The project has considered alternative water supply sources, but it did not find any that are suitable for the specific context of the Marshall Islands' outer islands. Groundwater sources are very limited on these islands, restricted to a shallow lens of fresh water that can be lost by rising sea levels and overtopping events. Desalination plants are difficult to operate and maintain on small islands because they need inputs of energy and spare parts to continue functioning, so they are only really viable in more densely populated areas where economies of scale enable costs to be recovered. Shipping in desalinated water, or bottled water, is prohibitively expensive.

24. It is noted that the 20 litres per day allowance (during a 70-day drought) is well below the 50 litres per day in guidelines published by the World Health Organization. This project will provide the communities with an emergency survival-level water supply during the most extreme droughts. Nevertheless, it may enable habitation of the outer islands to continue in cases where otherwise that might not be possible.

25. The proposed activity will upgrade existing rooftop rainwater harvesting systems on 158 community buildings and 2,529 households in 77 communities; and 121 new community roof/storage systems will be installed. Improvements to guttering and downpipes aim to increase the efficiency of the rainwater systems from 35 per cent today up to 80 per cent. First flush diverters and insect screens will reduce the environmental and health risks to the communities.

Component 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall; and enhancing women and youth leadership (total cost/GCF cost: USD 2.69 million, or 100 per cent)

26. This component will protect 2,586 priority household and community groundwater wells that are vulnerable to contamination from sea swells and high tides. Groundwater is recognized as a complementary water source for non-potable water uses. Protecting these sources will build resilience to droughts by reducing the pressure on drinking water supplies.

27. It will fund the protection of wells from surface pollution by lining the well for the full depth and to at least 0.6 m above the ground to form a head wall around the outer rim of the well. A concrete slab will be constructed on the ground surface, extending for 2 m around the well.

28. It should be noted that while these works help protect the wells and provide better sanitary conditions for users, they do not protect the water wells from salinization (caused by rising sea levels, high tides and storm events). They should be viewed as complementary to component 1 and not a substitution.

29. Component 2 will also create opportunities for learning exchanges and facilitate inter-island exchanges on best practices in climate change risk reduction for water resources, including water security and conservation of water resources. It is hoped that this will accelerate lasting change, lessons learned and wider implementation of these measures in similar environments for new projects.

30. Given that approximately 60 per cent of the population is less than 24 years old, women and youth have been selected as the target group. This activity will be undertaken in partnership with the Marshall Islands Red Cross Society, Women's United Together Marshall Islands (WUTMI), the National Youth Congress, and existing women and youth networks.

Component 3: Climate change induced drought preparedness and response measures implemented in outer atolls and islands (total cost/GCF cost: USD 3.98 million, or 100 per cent)

31. Component 3 will update national-level contingency plans and standard operating procedures for climate change induced drought response. It will support the Marshall Islands' Office of Chief Secretary (OCS), the National Disaster Management Office, municipal governments, the Weather Service Office, the Ministry of Finance, the Environmental Protection Authority (EPA), the Ministry of Internal Affairs, community and non-governmental organizations and development partners, and the private sector to develop systems to coordinate early warning and disaster response.

32. Training programmes for drought risk management and contingency planning at the institutional level will be provided to develop plans that are practical, results-oriented, simple, participatory, realistic and supported by preparedness actions.

33. At the local level, component 3 will also develop and implement community-based drought contingency planning. These plans will define goals and objectives, such as targets for reduced consumption and priority of use, based on the assessment of all existing and potential local water supply sources during episodes of extreme drought. Community water committees will conduct simple water balance assessments and access plans for community water resources defining rights of access and exclusion.

III. Assessment of performance against investment criteria

3.1 Impact potential *Scale: High*

34. The project has a clear climate rationale. The vulnerability of the freshwater lenses to climate-induced seawater overtopping and prolonged drought events makes rainwater harvesting a necessary and cost-effective investment to ensure the continued availability of drinking water to residents of the outer islands and atolls. The funding proposal has high cross-cutting impact potential.

35. From an adaptation perspective, the funding proposal adequately substantiates the climate threat faced by the freshwater aquifer lenses and existing rainwater harvesting systems, which are currently the only freshwater sources in the Marshall Islands apart from a few mobile desalination plants used in emergency situations. The lenses face the threat of the seawater overtopping during storm surges (a result of rising sea levels combined with storm surges) and more prolonged droughts. These events have the potential of rendering the water lenses useless for extended periods. It is estimated that the water lenses may be unusable 20 per cent of the time.

3.2 Paradigm shift potential *Scale: Medium*

36. The project may have a useful contribution to testing the viability and cost-effectiveness of rainwater harvesting in Pacific Small Island Developing States (SIDS), many of which are low-lying territories highly vulnerable to even modest sea level rises.

37. The financial sustainability of the intervention is a relevant risk factor that needs to be well managed by the United Nations Development Programme (UNDP) and the Government of the Marshall Islands.

38. UNDP is an active partner in the region and a key player in the eventual replication of the project in the Pacific SIDS. Several good opportunities and avenues for knowledge sharing

are identified, including the annual conferences of the Pacific Water and Wastewater Association and possible regional water sector events.

39. The project does not identify any innovative financial mechanism that can contribute to facilitate replication. Such replication would likely continue to be subject to substantial donor investments to cover the high level of capital expenditures.

3.3 Sustainable development potential *Scale: High*

40. The project's main social and economic co-benefits are improved health and well-being, temporary construction jobs, and development of a market for rainwater harvesting equipment and services. In a small economy there will also be some economic benefit from the local spending generated by the project, although this effect is temporary and should not be overstated.

3.4 Needs of the recipient *Scale: High*

41. The Marshall Islands is a highly climate vulnerable SIDS. With most of the country only about 2 m above sea level, its water resources and other assets are extremely exposed to sea level rise. Droughts and seawater overtopping are critical risks that can only be addressed with protected sources of safe and clean water.

42. The Marshall Islands is a lower middle-income country with a per capita income of USD 3,665 (2016). Approximately 20 per cent of the population of the Marshall Islands has been reported to be living on less than USD 1 per day.

3.5 Country ownership *Scale: High*

43. The proposed project is aligned with and directly delivers on the priorities outlined by the national development, climate change, water and disaster risk management policies of the Marshall Islands.

3.6 Efficiency and effectiveness *Scale: High*

44. In general, economic and financial returns in SIDS tend to be lower than in other countries due to relatively higher infrastructure costs and lower population densities, so assessments of cost-effectiveness need to consider that context. In the Marshall Islands, water utilities cannot viably operate commercially due to the geographic and population dispersion of the outer islands, which raises costs and decreases revenues. Therefore, grant financing is required to make the investment viable.

45. The economic analysis provided by the AE shows acceptable cost-effectiveness. The economic analysis modelled two counterfactual scenarios to compare with the project investments. In the first scenario, it was assumed that, in the absence of the project, the Government would procure additional reverse osmosis units to continue to provide 20 litres per person per day in times of water shortage crisis up to 2044, which would avoid most health or socio-economic impacts. Compared with this scenario, the project results in an economic internal rate of return (EIRR) of 12 per cent over 25 years, which is slightly higher than the UNDP social discount rate of 10 per cent. The EIRR remains above the discount rate if costs were to increase by 10 per cent or if the time period were limited to 20 years. In the second scenario, it is assumed that no additional reverse osmosis units would be procured, leading to provision of only 4.2 litres per person per day and resulting in negative health and socio-

economic impacts. Compared with this scenario, the project results in an EIRR of 4 per cent, which is below the social discount rate, indicate a negative net present value. However, the first scenario is considered more likely because the World Health Organization typically recommends 20 litres per person per day to meet basic needs, and a minimum of 7.5–15 litres per person per day in emergency situations.

IV. Assessment of consistency with GCF safeguards and policies

4.1 Environmental and social safeguards

46. **Environmental and social risk category:** The AE has screened the project using its social and environmental screening procedure and has assigned the overall social and environmental risk category for this project to be moderate. The GCF Secretariat confirms the category B classification which is also within the AEs accreditation level.

47. **Safeguard instrument and information disclosure**: The AE has developed an environmental and social management framework and management plan (ESMFMP) which provides guidance for executing entities to conduct environmental assessment and implement environmental management safeguards plans and ensure that the environmental and social objectives of the projects are met.

48. The ESMFMP provides for the legal and institutional framework for environmental and social aspects including the applicable legislation, policies and regulations in the environmental impact assessment in the Marshall Islands. The ESMFMP also includes environmental procedures for developing site and activity-specific work plans, inspection, environmental incident reporting, review and auditing, development of corrective actions and reporting. It also provides the institutional arrangements including management structures and responsibilities. The ESMFMP will be disclosed on the AE and GCF's website.

49. **Key environmental and social risks and impacts and mitigation measures**: The project activities' physical impacts will primarily be at the construction stage during the installation of equipment such as rainwater tanks, groundwater wells and pumps and are expected to be relatively minor and temporary. These include increase in noise and vibration levels, light intrusion if activities are conducted at night, potential for erosion and sedimentation, generation of solid and liquid waste and increase in dust particles. The ESMFMP provides for management measures to avoid, minimize and mitigate negative impacts of the interventions at each stage of the project cycle. Contractors are expected to prepare a site-specific Construction Environmental Management Plan (CEMP) which is specifically focused on construction related issues which will be cleared by UNDP prior to the actual construction works.

50. All project personnel are planned to attend an induction training that covers health, safety, environment and cultural requirements. The minor construction works pose minimal risks to workers and can be properly addressed by standard construction practices and use of personal protective equipment. The infrastructures also generate minimal risks and impacts to the health, safety and security of the public and beneficiary communities.

51. No compulsory land acquisition and/or compensation is expected to be implemented as the interventions will be typically established in existing public facilities, such as schools, health centres, and churches. While project interventions will be undertaken on land that is privately owned and land use agreements have already been put in place, the AE must ensure that these are based on negotiated settlements that meets the requirements of GCF's standards on land acquisition and involuntary resettlement. The project is not expected to impact biodiversity of flora and fauna as the structures will be located in already built-up areas. The AE's due diligence

and consultations conducted also found that no indigenous people and/or ethnic minorities are known to live in the Marshall Islands. No cultural heritage is expected to be affected by the construction activities.

52. **Institutional arrangements**: The ESMFMP provides for the institutional arrangements needed to implement the environmental and social safeguards of the project. This includes the involvement of the Office of Chief Secretary (OCS), who is responsible for the supervision of the EMSFMP. A project management unit (PMU) will be established to administer the day-to-day implementation of the EMSFMP and ensure implementation of the management measures by the contractors. The project will be administered by UNDP as the AE.

53. **Stakeholder engagement**: The ESMFMP provides for public consultation and environmental and social disclosure procedures to allow for continual engagement of stakeholders throughout project implementation including the manner and timing of disclosure of the applicable safeguards reports. A Stakeholder Engagement Plan is also prepared.

54. **Grievance redress mechanism**: The ESMFMP provides for the development of a grievance redress mechanism (GRM) and a complaints register to allow for resolution of complaints and/or grievances on terms that are mutually acceptable to all parties. The GRM will be made known to stakeholders during stakeholder engagement activities of the project.

4.2 Gender policy

55. The AE has submitted a comprehensive gender assessment, which also looks at youth and other vulnerable groups; therefore, it complies with the operational guidelines of the GCF Gender Policy and Action Plan. The gender assessment also includes a gender action plan.

56. The gender assessment provides information on the key priorities of the Marshall Islands on climate change resilience and water security while also illustrating various policies to address climate related issues. The national climate change policy framework also reinforces a human rights and gender and social inclusion approach. It further indicates that the Marshall Islands is committed to gender equality and women's empowerment, although it recognizes the challenges of translating this commitment to tangible actions. The analysis of water, sanitation and hygiene clearly illustrates the challenges climate change induced shortages pose for children in schools and women, elderly, people with disabilities, and female heads of households. The assessment was done based on literature reviews and was also supported by the findings of community level consultations, which were done with women, men, students and youth. The community consultation illustrated that while water fetching is s a household responsibility with the whole family contributing, men and young boys having a bigger role at times of shortages in fetching water. Female heads of household will have to rely on family members, friends and neighbours for their drinking water. There is also an indication that women and children play roles in fetching water from desalination units, with children leaving school to help mothers as well as women spending more time fetching water than necessary. The gender assessment further indicates that during drought seasons the work burden for women increases, with responsibilities for taking care of the sick heightened during periods of shortages. Further, the use of water will be restricted during menses as there are cultural restrictions for women and girls around these times. Decisions on water usage, especially at the community level, is indicated to be made mostly by men, with women having a less visible role. The stakeholder consultation with women indicates that women are not happy that men make the decisions on water usage and want to have a role in the decision-making process. Water management for consumption has been highlighted as a major area that needs improvement in addition to access to facilities (such as toilets in schools, water supply at the community level, and at household levels, water collection, water safety, quality, treatment and management, sanitation and hygiene, among others). The stakeholder consultation was also used to prioritize

water and sanitation issues with proposed solutions that include the views of women and men. The key issues identified were the limited or low water storage facility, lack of water supply and quality of water, no access to water testing and treatment kits, lack of support from the EPA, an increase in waterborne diseases, a decrease in economic opportunities and incomes, and a lack of toilet facilities.

57. The AE, based on the gender analysis, is expecting to see improvements in water quality and supply through investments in new and upgraded climate proof water infrastructure, ensuring target communities (women, men and youth) have the knowledge and ability to use water resources wisely as well as involve women and youth in decision-making processes at all levels. Further, the AE seeks to improve the country's compliance with international water security standards and international goals and targets regarding gender equality and social inclusion. Going forward, the AE will target 49 per cent female headed households as its beneficiaries, and 50 per cent women getting access to information and installation activities, with 25 per cent of youth as beneficiary of the project; these are a few of the outcomes the AE aspires to achieve.

58. The AE has committed to having two gender and youth specialists who will be the lead persons responsible for implementation of the action plan. At the same time, responsibility rests with the entire project team to ensure that all activities mainstream gender and youth issues.

59. The action plan includes baseline sex disaggregated targets, indicators and budgets. It includes activities that are aimed at addressing the challenges faced by communities with an emphasis on women, female heads and youth, including specific targets for female youth. The action plan also includes a timeline for each of the activities. The gender action plan's targets and indicators are aligned to the indicators and targets of the logic framework of the funding proposal.

4.3 Risks

4.3.1. Overall programme assessment (medium risk):

60. The funding proposal requests a GCF grant of USD 19.1 million accounting for 76 per cent of the total project cost. The Government of the Marshall Islands is co-financing USD 6.1 million and there is no co-financing from the AE.

61. The capital cost of proposed water investments will amount to USD 11,605 per household which is about 600 per cent of the annual household income in the outer islands of the country. As a SIDS, the country's estimated cost for adaptation is one of the highest in the world in terms of percentage of gross domestic product, at 7.24 per cent (ranked eighth in the world). The Marshall Islands faces high risk of debt distress as per the International Monetary Fund's Debt Sustainability Analysis; it would be difficult for the Government to raise debt financing for the project. These factors support the grant financing proposed by AE. However, for the long-term sustainability of the project, continued support from the Government for the O&M cost is necessary.

4.3.2. Accredited entity/executing entity capability to execute the current programme (low risk):

62. UNDP (the AE) has an extensive track record of working with governments in the 15 Pacific SIDS, delivering an average of USD 30 million per annum in the region. UNDP provides an oversight and quality assurance role involving staff in country, regional and headquarter offices. The AE has a long history of partnership with the Government of the Marshall Islands in the areas of climate change, integrated water management and natural resource management. The AE is also acting as an executing entity (EE) and will be responsible for the day-to-day activities

proposed in this project. The funding proposal mentions that, throughout the lifetime of the project, the project assurance and execution roles of UNDP will be strictly separated.

63. As an EE, UNDP will receive and manage the grant from the Government of the Marshall Islands under a cost-sharing agreement to be signed. The grant from GCF and the Government of the Marshall Islands will be blended during the implementation.

4.3.3. Programme-specific execution risks (medium risk):

64. International and national logistics: the funding proposal identified the risk of delays in project implementation caused by international logistical and procurement issues as well as national logistical challenges. The staff of the implementing partners lack experience in international procurement processes, and shipping schedules are prone to delay. These risks can be mitigated by the direct implementation modality of the AE, in which the AE handles the procurement process. In addition, the funding proposal also identified that, due to the remoteness and geographic dispersion of project sites, travel of relevant project personnel and transport are often postponed at the national level. The AE stated that it will combine the outer islands into three clusters based on geographic proximity to achieve cost efficiencies in organizing transport of personnel and goods.

65. Operation and maintenance (O&M) challenge: the funding proposal states that existing equipment funded by other grants/external providers is currently operating at 33 per cent of its capacity, because of the high cost and inadequacies related to the O&M of the equipment. The AE mentioned that the O&M challenge will be addressed through tested O&M models. The project will create community water committees for each outer island with support at the local government level, with clear guidelines and delineation of responsibilities focusing on building technical and financial capacity for sustainable O&M. For cost recovery of O&M, households are expected to provide between 7 and 17 per cent of their annual median income per year, while the affordable water tariff has to be less than 2.5 per cent of income based on International Benchmarking Network standards. As this is considered to be unaffordable, the Government of the Marshall Islands will provide the funding for O&M for the post-implementation period (18 years). However, it is recommended that a contribution from households/water users for (partial) O&M cost recovery be considered to enhance the ownership. The AE mentioned that it will support an exploration of feasible mechanisms, including contributions through the community water committees to augment the O&M funding provided by the Government.

66. Extreme weather events: the AE has identified the risk of natural hazards restricting inter-island access and installation activities. Extreme weather events may also damage and destroy ongoing project activities. This will create short-term response and recovery priorities for the Government and communities. The AE has suggested that the risks can be mitigated by spreading capital expenditure over three years, which will allow for adjustments in case of weather disturbances. The implementation plan and scheduling are designed to consider the likelihood of extreme weather conditions.

67. Economic viability: the AE has provided an economic analysis with two baseline scenarios over 25 years. The benefits are calculated in the form of avoided costs: costs of procuring and managing additional mobile desalination units; avoided drought emergency response costs; and avoided socioeconomic drought-related costs. While baseline scenario 1 results in an EIRR of 12 per cent, scenario 2 is expected to yield a negative net present value (EIRR 4 per cent). The AE stated that additional benefits are not included in the project because of difficulties in quantification and lack of data/studies. The long-term viability of the project after implementation will depend on the commitment and capacity of the Government/water users to finance the O&M of the project assets.

4.3.4. GCF portfolio concentration risk (low risk):

68. In case of approval, the impact of this proposal on the GCF portfolio risk remains non-material and within the risk appetite in terms of concentration level, results area or single proposal.

4.3.5. Compliance risk (medium risk):

69. Several reviews of the Marshall Island's financial sector by the Financial Action Task Force and other reviewing entities have identified deficiencies in the laws of the Marshall Islands regarding the prevention of money laundering and countering the financing of terrorism. Based on those findings, Compliance assigns a "medium" risk to the proposal.

4.3.6. Conclusion

70. It is recommended that the Board consider the above factors in its decision.

Summary risk assessment		Rationale
Overall programme	Medium	While the project may have some procurement and logistical challenges, the accredited entity's direct implement modality is expected to mitigate these. The project success will depend on continued support from the Government in financing operations and maintenance of the water assets after the project implementation.
Accredited entity/executing entity capability	Low	
Project-specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

4.4 Fiduciary

71. The EE (UNDP) will execute the GCF project under the Direct Implementation Modality as requested by the Government of the Marshall Islands.

72. UNDP assumes overall management responsibility and accountability for project implementation. Accordingly, the PMU is subject to UNDP policies and procedures. At the same time, as AE, UNDP will provide a three-tier oversight and quality assurance role involving UNDP staff in country offices and at regional and headquarters levels. In addition, independent of the project management function, UNDP will undertake the project assurance role that is covered by the AE fee to deliver GCF-specific oversight and quality assurance services including: (i) day-to-day oversight supervision; (ii) oversight of project completion; and (iii) oversight of project reporting.

73. The project will be guided by a project board (PB) and implementation will be via the PMU, which will be contracted by UNDP to be responsible for day-to-day activities. The work of the PMU will be overseen by UNDP. Headed by a project manager, the PMU will be set up to manage day-to-day financial disbursement and project implementation. The PMU will implement the project, under guidance of the PB and day-to-day supervision by UNDP and OCS within the constraints laid down by the PB and as per an annual workplan approved by the PB and reviewed by UNDP. The project manager's main responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

74. The PMU will comprise a group of project-financed staff who will support the project manager in the overall operational and financial management of the project, and liaise with relevant stakeholders. During implementation, UNDP will assess the engagement of project partners, including government departments (such as EPA and OCS), and the International Organization for Migration for provision of specific services consistent with the Direct

Implementation Modality under the Framework for Cash Transfers to Implementing Partners (part of the harmonized approach to cash transfers).

75. The financial management, audit and procurement functions of this project will be subject to UNDP financial rules and regulations and guidance outlined in the financial resources management section of the UNDP Programme and Operations Policies and Procedures.

76. UNDP will perform monitoring and reporting throughout the reporting period, including semi-annual reporting, in accordance with the accreditation master agreement and the funded activity agreement.

77. It is recommended that the AE address the outstanding minor comments in relation to the budget and budget notes, the term sheet and the AE fee budget.

78. This draft assessment summary is subject to change depending on the response of the AE.

4.5 Results monitoring and reporting

79. The proposal addresses adaptation impact on two result areas: (i) most vulnerable people and communities, and (ii) health and well-being, food and water security. The proposal also has the expected number of direct and indirect beneficiaries at 15,572 and 55,226, respectively.

80. Regarding the logical framework, the revised funding proposal adequately reflected comments provided by the Secretariat in response to the previous version at the impact, outcome and output level. Furthermore, it elaborated on the interventions for paradigm shift objectives to mainstream climate change adaptation into national planning and development.

81. In response to the Secretariat's request for clarification on the roles and responsibilities of the project implementing partners and responsible parties, the AE confirmed that annual periodic reviews will be conducted where the relevant inputs from all responsible parties will be sought by the PMU.

4.6 Legal assessment

82. The accreditation master agreement was signed with the AE on 5 August 2016, and it became effective on 23 November 2016.

83. The AE has provided a legal opinion/certificate confirming that it has obtained all internal approvals and it has the capacity and authority to implement the project.

84. The proposed project will be implemented in the Marshall Islands, a country in which GCF is not provided with privileges and immunities. This means that, among other things, GCF is not protected against litigation or expropriation in this country, the risks of which need to be further assessed. The Secretariat submitted a draft of the privileges and immunities agreement and a background note to the national designated authority on 7 April 2016 and again on 17 February 2017. No response on the draft agreement has been received so far.

85. The Heads of the Independent Redress Mechanism and Independent Integrity Unit have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by GCF are made only after the GCF has obtained satisfactory protection against litigation and expropriation in the country or has been provided with appropriate privileges and immunities.

4.7 List of proposed conditions (including legal)

86. In order to mitigate risk, it is recommended that any approval by the Board is made subject to the following conditions:

(a) Signature of the funded activity agreement in a form and substance satisfactory to the Secretariat within 180 days from the date of Board approval; and

(b) Completion of legal due diligence to the satisfaction of the Secretariat.

Independent Technical Advisory Panel's assessment of FP112

Proposal name:	Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands
Accredited entity:	United Nations Development Programme (UNDP)
Project/programme size:	Small

I. Assessment of the independent Technical Advisory Panel

1.1 Impact potential *Scale: High*

1.1.1. Adaptation impact

1. The project seeks to enhance water security in the Marshall Islands, mainly through the improvement and expansion of individual and communal rainwater harvesting (RWH) systems and the protection of existing groundwater wells to avoid contamination from sea swells and high tides. Project activities focus on the rural communities of the outer islands and atolls, where the vulnerability to drought is exacerbated by remoteness and weaker infrastructure.

2. RWH infrastructure activities include 2,529 household systems and 158 communal systems improved by the replacement of the existing 75 millimetre (mm) and 100 mm gutters, downpipes and connections with wider 150 mm ones and the addition of first flush debris trap systems. Communal RWH systems would also receive additional storage tanks.[1] The project plans for 121 new communal RWH systems, consisting of 200 m^2 roofs and 50 m^3 tanks, will be constructed across the 77 target communities.[2] The independent Technical Advisory Panel (iTAP) requested the proponent to submit the calculations for rooftop surface and water tank volume calculations for the new communal RWH systems (which were not submitted in the proposal). The proponent submitted these calculations for each zone of influence. The TAP reviewed these calculations and concluded that the design proposed is consistent with the average amount of rainfall, available rooftop surface and proposed water storage tank volume.

3. Activities to protect wells consist of infrastructure works to protect 2,586 household and community groundwater wells, which play a key role as complementary water sources for non-potable uses, increasing drought resiliency.

4. Concerning institutional strengthening, the project would deliver training programmes to support governmental institutions, community-based water committees and the private sector in developing, implementing, operating, monitoring, and maintaining drought contingency plans, standard operating procedures and early warning systems.

5. The project would also provide training to women and youth on efficient use of rainwater, and would create mechanisms for inter-island knowledge exchange.

6. Direct beneficiaries, defined as the whole population of the targeted communities, who would benefit from improved household or communal RWH systems and protected groundwater wells, are estimated at approximately 15,600. The entire population of the

[1] Funding proposal, paragraphs 122 to 124.
[2] Feasibility study, annex IIb, pages 134 and 171.

country, approximately 55,000 people, would indirectly benefit from the strengthened institutional capacity of governmental agencies.[3]

7. If the improved and new RWH systems are maintained and operated adequately, the systems would be able to provide 20 litres per capita per day of rainwater for almost 100 days without rain. This is 40 per cent more capacity than that needed for the assumed average baseline drought (with no climate change), and it is consistent with the climate change drought projections described in the feasibility study.[4] The total storage capacity of the target communities, currently estimated at almost 10,000 cubic metres (m^3), would reach approximately 30,000 m^3 after project implementation.[5]

1.2 Paradigm shift potential *Scale: Medium*

1.2.1. Innovation

8. Individual and communal RWH systems already exist and have been used in the Marshall Islands. The innovative aspect of the project resides in the integrated approach, which combines improvement and expansion of RWH systems, well protection, awareness-raising on the demand side, and institutional strengthening at local and national levels.

1.2.2. Potential for knowledge and learning

8. Activity 2.1 would include the development of mechanisms for inter-island knowledge exchange. However, these mechanisms are not described in the proposal.

9. Training programmes would be focused on women and youth, and include the development of Water Safety Plans, RWH systems operation and maintenance, demand management, sanitation and hygiene, disaster standard operating procedures and drought preparedness. This activity will be undertaken in partnership with the Marshall Islands Red Cross Society, Women United Together Marshall Islands, the National Youth Congress, and existing women and youth networks.[6]

1.2.3. Contribution to the creation of an enabling environment

10. Concerning sustainability, the operation and maintenance of individual RWH systems would be the responsibility of private households.[7] Communal RWH systems would be operated and maintained by the community-based water committees, with funds provided by the government. The government submitted a co-financing commitment letter that includes the allocation of funds to cover operation and maintenance (O&M) from year 7 to year 25. The low average annual income in the outer atolls would make it unaffordable to set a tariff to recover even O&M costs.

11. Institutional strengthening and trainings in general would also support long-term sustainability.

1.2.4. Scalability and replicability

12. As the project already covers almost the entire rural population of the country, and urban centres are supplied by water utilities, there is little room for scaling up within the

[3] Funding proposal, paragraph 178.
[4] Feasibility study, annex IIa, page 34.
[5] Funding proposal, Figure C2.1.
[6] Funding proposal, paragraph 133.
[7] Excluding renewals, which would be covered by the government.

Marshall Islands. However, there is a moderate potential for replication on other small island developing States within similar contexts.

1.3 Sustainable development potential *Scale: High*

1.3.1. Environmental co-benefits

13. The project would generate a reduction of greenhouse gas emissions by reducing energy consumption for: (1) desalination; (2) transportation of water to remote atolls; and (3) inter-island transportation of inhabitants of outer atolls who migrate during droughts due to insufficient water availability.

14. Other environmental gains include avoided production of plastic waste from bottled water and reduced contamination of groundwater through groundwater well protection works.

1.3.2. Social co-benefits

15. Enhanced availability of water for drinking and hygiene purposes would improve health standards of the population, especially during drought periods, reducing the incidence of food- and waterborne diseases.

16. Communal RWH systems at public schools would improve attendance.

1.3.3. Economic co-benefits

17. Improved health would reduce health-care expenses and impact positively on productivity and long-term human development. The stabilization of outer atolls due to reduced migration would create opportunities for social and economic development of these atolls and take pressure off the two main urban centres.

18. Besides the job opportunities that would arise through implementation of the project, it is expected that given the scale of the investments, the project would indirectly promote the development of RWH and sanitation services, mostly related to maintenance of RWH systems and the installation and maintenance of sanitation systems.

19. The reduced dependence on water desalination units would reduce the overall costs of water supply on the Marshall Islands.

1.3.4. Gender-sensitive development impact

20. The project would have greater benefits for women, since they are usually responsible for domestic hygiene and for collecting water from communal RWH systems or from mobile desalination units during droughts. Also for this reason, Water, Sanitation and Hygiene for All trainings would be focused on women and youth.

1.4 Needs of the recipient *Scale: High*

1.4.1. Vulnerability of the country, vulnerable groups and gender aspects

21. The vulnerability of the Marshall Islands to climate change effects is adequately described in the proposal.

22. Water security on the Marshall Islands, which is the sole focus of this project, is highly susceptible to climate change. The islands have no rivers, streams or lakes; the only sources of surface freshwater are a limited number of small ponds, which usually have poor water quality.

23. Groundwater is moderately to extremely saline, depending on the season, tide, location and depth of the well. Information regarding specific locations, available volume, and quality of

groundwater is limited. Groundwater is normally used for washing, cleaning and sanitation, and during droughts is also used for drinking and cooking. Groundwater represents less than 2 per cent of the water supply in rural communities. Groundwater lenses with moderate salinity are threatened by the risk of sea-level rise and reduced precipitation.

24. Historical data shows a decreasing trend for rainfall volumes, and an increasing drought risk. The proposal includes a specific "Report on Climate Change Projections", focused on precipitation and drought, presented as annex 22 of the feasibility study.[8]

25. Being a low-lying island nation with no major points of elevation above two metres, it is highly vulnerable to potential sea level rise.

26. The project targets rural communities of the outer atolls and islands, which are the most vulnerable groups in relation to water security.

1.4.2. Economic and social development

27. With a per capita gross national income of USD 4,840, the country is classified as "upper middle income".[9] Despite the relatively high gross national income, data show high inequality: the national poverty rate is almost 40 per cent, and it reaches 60 per cent for the outer atolls.[10]

28. Due to its small size and remoteness, the development of economic activities is significantly limited.

29. The Marshall Islands gained independence from the United States of America in 1986, and the country remained an "associated state" under a Compact of Free Association. Direct grants from the United States of America account for nearly a quarter of the gross domestic product of USD 180 million. Approximately 30 per cent of the national income comprises international assistance. The remaining income of the country is generated by royalties from the fisheries sector, small-scale handicrafts, and processing of coconut products and tuna.

30. Access to education and other services is nearly universal. However, the country fails in indicators such as under-5 mortality and infant mortality rates compared to other countries of similar income.[11]

1.4.3. Absence of alternative sources of financing

31. The financial situation of the country, including current indebtedness, is clearly explained in the proposal, and demonstrates that the Marshall Islands' financial resources are very limited and highly dependent on international grants.

1.4.4. Need for strengthening institutions and implementation capacity

32. Institutional needs, which are recognized and addressed in the proposal, include limited coordination, reporting and accountability mechanisms, lack of formalized roles and responsibilities at the subnational and community level, insufficient information generation and sharing for all types of water resources at all levels, and poor water governance in general.

33. In this regard, the project would provide, through output 3, a series of capacity-building activities at national and subnational levels.

1.5 Country ownership *Scale: High*

[8] Feasibility study (annex IIb), page 158.
[9] Source: World Bank. Available at <https://data.worldbank.org/country/marshall-islands?view=chart>.
[10] Feasibility study (annex IIa), page 21.
[11] Funding proposal, paragraph 236.

1.5.1. Alignment with national climate strategy and policies

34. The project is aligned with national and regional policies and plans related to water security and climate change, which include: Vision 2018 (main policy instrument regarding sustainable development), National Strategic Plan 2015–2017, Marshall Islands Climate Change Roadmap 2010, National Climate Change Policy Framework, Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management for the Marshall Islands, Micronesia Challenge and Reimaanlok Action Plan, National Water and Sanitation Policy and National Environmental Protection Act (Amendment) 2016.

35. Concerning international goals and frameworks, the project is in line with the United Nations Framework Convention on Climate Change, the Sendai Framework for Disaster Risk Reduction 2015–2030, and the Sustainable Development Goals.

36. The proposed project would also synergize with the joint project of the Global Environment Facility and United Nations Development Programme titled "Reimaanlok – Looking to the Future: Strengthening natural resource management in atoll communities in the Republic of Marshall Islands employing integrated approaches", and would be complemented by the proposed Global Environment Facility-funded regional project "Managing Coastal Aquifers in Selected Pacific SIDS" covering the Marshall Islands, Palau and Tuvalu, which would cover understanding, use, management and protection of coastal resources.

1.5.2. Capacity of accredited entities or executing entities to deliver

37. The United Nations Development Programme would act as both accredited and executing entity, and it has sufficient experience in climate change adaptation projects globally and regionally, as described in the funding proposal.

1.5.3. Engagement with civil society organizations and other relevant stakeholders

38. Engagement with relevant stakeholders was adequately handled through meetings, workshops, surveys, focus-group discussions, and site observations. Consulted stakeholders include the President of the Marshall Islands, national government representatives from various Ministries and Departments, Mayors, Senators, village chiefs, school teachers, health practitioners, school children, women and men's group members, youth groups, public utility companies, shipping companies, civil society organizations, international agencies, universities, development partners, and regional agencies.[12]

1.6 Efficiency and effectiveness *Scale: Medium to High*

1.6.1. Cost-effectiveness and efficiency

39. For the identification of the most cost-effective interventions to secure potable water availability during drought periods, the proponent used Marginal Abatement Cost Curves, which resulted in the selection of household and communal RWH system improvement, and construction of new communal RWH systems. Well protection was not considered in this evaluation due to the salinity and largely unknown quality of groundwater which render it, in most cases, unreliable as a drinking water source.

40. This procedure identified approximately 1,600 cost-effective interventions on household RWH systems. However, a re-evaluation taking into account the ability to implement the project and its gender and social equity concluded that household RWH improvements would cover all households with dysfunctional systems, which was estimated at approximately 2,500 households.

[12] See Annex XIII (d-1)

41. The budget for output 1 includes two foreign field engineers during the first four years of the project[13] who would be responsible for the design, installation and technical support for O&M of household and communal RWH systems and related interventions. At an assumed cost of USD 534/day, they would cost the project a total of USD 1.4 million. In the opinion of the iTAP, design, installation and O&M of RWH systems should be simple enough to be handled by local technicians. To ensure their capability for these tasks, local staff could receive training prior to project implementation. Besides reducing project costs,[14] having trained local technicians would significantly support country ownership and post-project sustainability. In response to this comment from TAP, the accredited entity indicated that the foreign engineers will also perform surveying and design activities that would require an engineering degree. The accredited entity presented terms of reference for these engineers, which, in the opinion of TAP, could be handled by junior engineers or technicians.

1.6.2. Amount of co-financing

42. The Government of the Marshall Islands would co-finance 24 per cent of total project costs by providing USD 6.1 million. The GCF/Marshall Islands co-financing ratio is 3:1. Besides this, the Government co-financing letter includes a commitment to provide extra post-project financing for USD 14 million in the form of grant and in-kind, to be delivered from the eighth to the twenty-fifth year, which would be used for O&M and asset renewal. However, the method for the estimation of post-project costs is not described in the proposal.

1.6.3. Financial viability

43. The need for grant financing is best illustrated by the fact that approximately 60 per cent of the annual budget of the Marshall Islands comes from contributions from donors. Also, the project would not generate direct revenues.

44. The economic benefits considered for the economic analysis comprise the following:

(a) Avoided costs of maintenance and storage of mobile reverse osmosis units and procurement of new units;

(b) Avoided costs for deployment of mobile reverse osmosis units; and

(c) Avoided socioeconomic drought-related costs and losses, including health costs and reduced productivity due to more time spent in collecting water.

The analysis considered two baseline scenarios: (1) procurement of additional reverse osmosis units to be able to provide 20 litres per capita during droughts; and (2) provision of only 4.2 litres per capita per day with existing reverse osmosis units.

45. When considering baseline scenario 1, economic benefits of the project include avoided costs of procurement of additional reverse osmosis units to provide 20 litres per capita per day during droughts and maintenance and storage costs. In this case, net present value of the project is USD 2.09 million and the economic internal rate of return is 11 per cent. When considering baseline scenario 2, economic benefits include avoided costs of maintenance and storage of reverse osmosis units to provide 4.2 litres per capita per day during droughts and avoided socioeconomic costs (health and productivity). This case results on a negative net present value and an economic internal rate of return of 4 per cent. As suggested in the funding proposal, the reason for this may be the underestimation of economic benefits, as well as the non-inclusion of benefits from outputs 2 and 3, while the project cost includes all three outputs.

[13] See annex XIIIe to the funding proposal titled "Detailed Budget". It considers four engineers for six months per year each. For this reason, it is assumed they are foreign engineers.

[14] Local technicians should be significantly less expensive than foreign engineers.

1.6.4. Best practices

46. The improvement of household RWH systems includes replacing all existing 75 mm and 100 mm downpipes for new 150 mm ones. As per the rough calculations of the iTAP, two 100 mm downpipes should be enough to drain the average household rooftop surface.[15] The TAP requested the accredited entity to revise the catchment design to verify that the expected rainwater flow would actually demand installation of downpipes wider than 100 mm. The proponent described the data sources used for the design of the catchments, justifying the necessity for 150 mm gutters and downpipes.

47. Flat pack modular tanks, which would be used on the new communal RWH systems, could be considered innovative, and present a series of advantages compared to traditional concrete tanks.[16]

II. Overall remarks from the independent Technical Advisory Panel

48. The iTAP recommends this project for approval.

49. The iTAP recommends the accredited entity to:

(a) Review the cost of water tanks, considering other options for types of tanks that could result in a reduction of costs; and

(b) Evaluate the actual needs and costs related to foreign engineers, trying to maximize the participation of trained local technicians.

[15] Considering an average rooftop surface of 54 m^2, 100 per cent connected to the RWH system, two downpipes (as in the project design) could deal with rains of up to 440 mm/hour. (As a reference: 500 mm in 24 hours is considered extreme torrential rain.)

[16] For more details see Feasibility Study (annex IIb), page 126.

Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP112)

Proposal name: Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands

Accredited entity: United Nations Development Programme

Impact potential
The high rating is noted.
Paradigm shift potential
Innovation An additional aspect of the innovation is the institutionalisation of monitoring and management of the RWH systems –local Community Water Committees (CWCs) will report on the status of island storages to a national agency, so that for the first time, RMI will have a national view of its domestic water supply. Being able to monitor and therefore better manage water resources at a national level will be of significant benefit to RMI. *Potential for Knowledge and Learning* The full range of mechanisms will be employed, both formal and informal and building on ongoing initiatives. National and local government and community/NGO networks will be active partners. CWCs will be coordinated nationally, and therefore provide a ready pathway for exchange of learnings between islands. Project training and capacity building initiatives will bring representatives from various communities together and allow sharing of lessons learned. Exchange visits between 'Model' atolls/villages other villages, which may be lagging, may be utilized. Finally, RMI has a relatively small population of closely related families, this results in rapid informal exchange of news and ideas between the islands. The focus of the project on engaging with local communities, and particularly women and youth, will help to tap into this informal, but very powerful, network. Further details can be found in E.2.2 of the FP.
Sustainable development potential
The high rating is noted.
Needs of the recipient
The high rating is noted.
Country ownership

The high rating is noted.

Efficiency and effectiveness

Cost-effectiveness and efficiency

The budget for Output 1 includes two foreign field-engineers during the first four years of the project, who would be responsible for the design, installation and technical support for O&M of household and communal RWH systems and related interventions. iTAP has indicated that the design, installation and O&M of RWH systems should be simple enough to be handled by local technicians. The field engineers will be required early in the project and considering the limited pool of local engineers, budgeting was for foreign engineers. It is to be noted that RMI national government agencies have been employing engineers from overseas in recognition of the constraint. The budgeted daily rate is deemed appropriate as it includes the salary and cost of living at the work station (Majuro). Furthermore, the daily rate is within UNDP guidelines.

Nonetheless, during procurement, UNDP will explore other staffing combinations that would meet the project needs and where possible provide improved project outcomes. This would include tapping the local pool of technical experts, if available.

Amount of Co-financing

The proposal documents the commitment by RMI government to provide approximately $14M in post-project funding for sustenance and O&M, made up of costs associated with:

- Household improvements
- Community rainwater tanks
- Community RWH improvements/ building
- Community roof catchments
- Concrete tank liners
- Ground water improvement sites

The O&M financing, after the project period (years 8 - 25), has been calculated at atoll level and for each water asset category above, separately for baseline drought and climate change induced drought. These costs include: regular maintenance of water assets (essential spares and supplies), sustenance (re-investment in sub-components and major repairs required to optimize asset life cycle – estimated at 5% of capital costs once every 8 years), asset replacement (after the assets have met their engineering design life cycle), and travel, transportation and installation labour costs. Further details on O&M can be found in the FP Section E.6.3, Annex XIIIb (Operations & Maintenance plan) and FS Annex 19.

Overall remarks from the independent Technical Advisory Panel:

ITAP Overall Comment #1: Review the cost of water tanks, considering other options for types of tanks that could result in a reduction of costs.

Several different types of tanks were considered during development of the Feasibility Study: moulded plastic tanks; concrete tanks; concrete block tanks; modular steel tanks with liner; modular HDPE; and timber tanks with liner. This is described in detail in Section 8.3.1 of Annex IIa.

The modular flat packed tank option was selected for its durability, ease and speed of construction, life expectancy, potable water quality and transportability. Shipping of large tanks to small communities in the outer atolls and islands is a major constraint as materials are likely to be offloaded on to small boats due to a lack of wharf infrastructure. Flat packed tanks also offer the advantage of being able to be moved to different locations, if it becomes necessary. The project will approach the market with tenders to supply based on required performance specification (for example, warrantied for at least 20 years, suitable for storage of drinking water) rather than specific tank types, so that competitive market solutions can be presented.

ITAP Overall comment 2: Evaluate the actual need and costs related to foreign engineers, trying to maximize the participation of trained local technicians.

As clarified above in the response under Efficiency and Effectiveness, skilled field engineers are critical to the implementation of the project. The project will seek to procure appropriate skills locally before searching further afield. Furthermore, alternate staffing combinations that result in provision of appropriate skills, increased local content and/or cost savings will be considered.

Gender Assessment and Action Plan

Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands

I. Introduction

This gender assessment aims to provide an overview of the gender situation in the Republic of Marshall Island (RMI) with a specific focus on the severe threat of water scarcity, identify gender issues that are relevant to the project, and to examine potential gender mainstreaming opportunities. The assessment was based upon available data from studies conducted by the Government of the Marshall Islands, donor agencies and multilateral development banks as well as extensive community consultations as part of the project design process as outlined below:

- ***Literature review***: this analysis includes the results of a comprehensive literature review of relevant CCA, disaster risk management, water security and gender equity and social inclusion issues in RMI, benchmarked against regional and global standards as needed. This assessment makes extensive reference to the results of the 2016 Post Disaster Needs Assessment (PDNA)[1] Gender Assessment, which enabled expansion and triangulation of data gathered during the design process.

- ***National level stakeholder consultations***: conducted with 42 community representatives, including relevant government agencies, civil society organisations and development partners using individual interview and small focus group formats; 12 members of the "Cook House Confidential" to discuss emerging water sanitation and hygiene (WASH) and menstruation hygiene management (MHM) issues; 6 staff from the Ministry of Internal Affairs (MIA) to discuss the Ministry's plans and activities with respect to addressing climate change and water security issues and to better understand the impacts of water shortages on women, youth, children, the elderly and people with disabilities; 3 representatives from the National Training Council (NTC) and the College of the Marshall Islands to discuss training options to build local capacity for water infrastructure operations and maintenance (O&M), and 26 participants who attended the National Stakeholder Workshop on 24 August 2016.

- ***Community consultations:*** In total, the community consultation process involved 1,280 respondents which included 695 women, 132 female students, 385 men and 68 male students in living in 22 Atolls, 36 Islands & 26 villages. A separate survey was conducted with students in 18 elementary schools and 1 high school in targeted areas to augment findings of the GIZ *Climate Change Resilience Project* design research on the adequacy of sanitation systems in outer island boarding schools.

- ***Site visits***: to assess existing water infrastructure and technology as the basis for investment plans; Analyze the operational environment including management and O&M capacity support needed to ensure sustainability of new water resilience investments and Identify potential social and environmental impacts as the basis for designing measures to prevent and/or mitigate potential negative impacts and risks for vulnerable groups of people.

- ***School consultations***: discussions with a total of 200 students (132 female and 68 male) in 18 elementary schools and 1 high school in targeted areas. The purpose of these consultations was to solicit the views of students on the adequacy of water and sanitation facilities at their schools and the impacts this has on their education (attendance, performance and attitude) and overall well-being, and to augment findings of the GIZ Climate Change Resilience Project design research on the adequacy of sanitation systems in outer island boarding schools.

- ***Engagement of local research team***: with local NGOs, namely the Women United Together Marshall Islands (WUTMI) and the Marshall Islands Organic Farmers Association (MIOFA)

[1] Post Disaster Needs Assessment RMI 2016 (DRAFT REPORT, 23 September 2016).

assisted with the community consultation process by gathering additional baseline information from outer atolls and islands not visited by the international design consultants.

The project design team used a participatory bottom-up approach to ensure that proposed investments would directly respond to the identified needs and priorities of communities, households and vulnerable groups of people. When arranging village level consultations, the design team adhered to traditional protocols with respect to organising meetings and logistics by working through national and island level government officials and traditional leaders prior to making direct contact with communities. These officials arranged meetings in consultation with target communities and made introductions for the team. This methodology was selected as it closely aligns with Marshallese cultural systems of knowledge transmission.

This assessment is primarily concerned with the impacts of "socio-economic droughts" which occur when physical water shortages start to affect the health, well-being, and quality of life of the people and when drought starts to affect the supply and demand of the production of goods and services in a given location.

Theory of Change

To tackle the root cause of current water insecurity in the Marshall Islands, the proposed project will transform how water investments are made in RMI from a reactive, drought response approach to a more holistic and integrated water resilience approach that is proactive, strategic, inclusive, participatory and evidence-based. In line with the RMI National Water and Sanitation Policy, the proposed project will have a specific focus on targeting services for the disadvantaged. Through improved water governance, integrated water management systems will be scaled where multiple freshwater resources and supply systems are implemented and sustained with strengthened financial and technical capacities for operation and maintenance, technical knowledge and skills for installation, operation, maintenance, and monitoring.

Rights-based approach:

Access to clean water is a basic human right and a universal development priority with great potential to improve health, life-expectancy, education, food security and livelihoods. Sustainable Development Goal (SDG) #6 is: "to ensure availability and sustainable management of water and sanitation for all".

Gender Equity and Social Inclusion

The term gender equity and social inclusion (or GESI) is used throughout this analysis in keeping with global, regional and national research which clearly demonstrates that the impacts of climate change are most acute for the poorest and most vulnerable members of any society. This includes women, children, the elderly and those with disabilities - especially when they are living in under-serviced areas and/or are isolated from planning and decision-making processes. Starting from this already exposed position, the impacts of climate change serve to magnify existing inequities and intensify associated risks. As such, this analysis considered the differential impacts of climate change and water security issues on vulnerable groups of people throughout the RMI in order to ensure that gender equality and social inclusion are fully mainstreamed in all aspects of the project design. In addition to mainstreaming, targeted interventions aimed at addressing specific vulnerabilities have been incorporated in the project design to ensure that men, women, boy, girls and people with disabilities will benefit equally from the suggested interventions.

In addition, GESI terminology is important from a community buy-in perspective as there is often a high degree of resistance in the RMI (and other Pacific Islands) to any real discussion of gender issues – which are seen as "women's issues". As such, broadening the discussion to be inclusive of other vulnerable groups encourages communities to be more open-minded, encompassing and thoughtful about people's unique vulnerabilities and perspectives.

The GESI perspective is consistent with the RMI *National Climate Change Policy Framework which* reinforces a human-rights and GESI approach.

"The needs of the most vulnerable groups [in our society] such as women, children, the elderly and those with special are given priority in emergency preparedness and response planning and implementation through the use gender sensitive climate change responses".

II. GESI in the Marshall Islands

The purpose of this section is: i) to provide a summary of key gender equity and social inclusion factors in relation to demography, culture, economy and livelihoods, health, education, disabilities, domestic violence and climate change, and ii) to ensure that key RMI statistical data, climate change adaptation/disaster risk reduction policy and institutional arrangements are considered from a gender and social inclusion perspective.

Table 1: Key RMI Development Statistics

Population		
Total Population	**53,158**	2011
Male Total (%)	27,243 (51.2%)	2011
Female Total (%)	25,918 (48.8%)	2011
Urban Total (%)	39,205 (73.8%)	2011
Rural Total (%)	13,953 (26.2%)	2011
Total Households	7,779	2011
Average household size	6.8	2011
Total (updated estimate)	55,000	Mid-year 2016
Male Total (%)	28,100 (51.1%)	Mid-year 2016
Female Total (%)	26,900 (48.9%)	Mid-year 2016
Average annual growth rate	0.4%	2011
Infant mortality rate	25.4%	2009 - 2011
Life expectancy at birth - Total	71.8	2011
Life expectancy at birth - Male	71.3	2011
Life expectancy at birth - Female	72.5	2011
Population density (people / km^2)	304	2016

Source: RMI. 2011. Marshall Islands - Census of Population and Housing 2011

Demography

The RMI is an archipelago of 29 atolls and 5 islands located just north of the equator in the heart of the Pacific Ocean. The RMI is considered "small island developing state" (SIDS) but is also a "large-ocean state" given the country is spread over 750,000 square miles, with more than 2 million square kilometers of exclusive economic zone (EEZ). At the time of the last national census (2011) the RMI had a population of 53,158 people with population density varying markedly by atoll/ island.

According to the 2011 census, the average Marshallese household comprised 7.2 members, however in urban areas 33 % of households have nine or more members compared with 25 % in rural areas. This population distribution pattern contributes to existing urban housing shortages and dense living conditions, with one quarter of all urban households using only one room for sleeping. An estimated of only 26 % of households in the Marshall Islands are headed by women and about 80% of these are in Majuro and Kwajalein. Women marry, on average, at 24 years compared with 26 years for men.

The population of RMI is very young; in 2011 40% of the population was estimated to be 1 – 14 years of age with the median age of 21 years old, making RMI the second youngest population in the Pacific. In 2016, approximately 60% of the population was estimated to be less than 24 years old with 19% under 14 years old. This age structure means that when the young population eventually reaches reproductive age, the result will be a high population growth rate for some years to come with significant consequences on future demand for goods, services and natural resources, including fresh water.

The population of the RMI has been steadily migrating from the outer atolls and islands to the two urban centers of Majuro and Kwajulein in search of better economic opportunities and services. As such, the urban population continues to grow resulting in depletion of the groundwater resources due to increasing water demand and pollution. Urbanization is also contributing to the decline of the outer island economy, thereby increasing the gap between rich and poor.

Women and Culture

Marshallese society is based on a system of exogamous matrilineal clans; traditionally, people lived in extended family groups of three or more generations. Each person belongs to his or her mother's *bwij,* or lineage and has rights to use lineage land and other property. These lineage groups own most of the land in the Marshall Islands; land can only be "owned" by citizens. Most Marshallese have land rights on several atolls or islands.

For thousands of years, the people of the Marshall Islands survived on thin stretches of land in a vast universe of ocean. Survival required knowledge, experience and access to critical land and sea resources. The importance of land to Marshall Islanders is not just about having a place to live; it is considered the essence of Marshallese life.

The RMI is a matrilineal society, with children belonging to their mother's lineage and having rights to use land owned by their lineage group. Traditionally, the succession of land rights gave women a position of great importance and influence in society. As such, women were traditionally the decision-makers and owners of land resources. Modernization has served to change traditional land tenure practices in many ways and noted in the *National Gender Mainstreaming Policy;*

This scenario is especially apparent in the male dominated world of infrastructure and maintenance, and in government agencies responsible for work in these sectors. A similar situation often exists in sub-national and community level decision-making forums where men typically dominate.

In Marshallese custom, women are referred to as *jined kibed*. Translated, this means that a mother (*jined*) is the rudder (*kibed*) of a family - her well-being directly impacts family dynamics much like the rudder of a canoe. If the rudder is compromised, the canoe will become *pelok*, or drifting without direction.

Women, Youth and the Economy

According to the 2011 RMI National Census, there are a total of 12,647 people in the labor force, with 51% of all men of working age engaged in either paid or unpaid work, compared to 28% of women of working age - which is 23% lower than the male equivalent. Men are more likely to work for wages or salaries than women, and women are more likely to be engaged in producing goods for sale with 30% of women working in craft and related occupations compared with 23% of men. The majority of women in the outer islands are involved in income-generating activities in goods production and processing and the cultural industry, with this income being essential for family survival.

Female household heads have an average annual income of USD 4,503 compared with USD 7,913 for male headed households. While this 43% gap doesn't reflect the income of other household members, it does point to the economic vulnerability of female headed households. Almost 40% of female household heads were not partnered or married compared with 10% of male headed households; 54 % of these women are widowed; and 38 % are aged 50 years and older.

Although the incidence of absolute poverty is low in the RMI, data indicates a high level of inequality, evidence of malnutrition in urban areas, and limited access to cash incomes in rural areas. The Global Facility for Disaster Reduction and Recovery (GFDRR, 2011) reported that 20% of the country's population lived on less than US$1 a day. As a result, families have limited income to support themselves - especially given that the minimum wage is $2 per day. This creates immense challenges in accessing basic household supplies and services for many families. Child labor is also common in the RMI and there is no minimum salary for children who work on farms or engage in fishing activities.

According to the 2015 Skills Demand Survey, about 38% of the working population was employed in the public sector and 39.7% in private sector enterprises.[2] Whilst there is an almost equal share of male and female employees in the public sector, two-thirds of all jobs in the private sector are occupied by males. According to the 2011 Census, the majority of Marshallese workers were employed in the service

[2] *Republic of the Marshall Islands Training Needs and Gaps Analysis.* European Union: Pacific Technical and Vocational Education and Training Project. Prepared by Helene Jacot des Combes, August 2015.

sector (72.7%), followed by industry (16.3%) and agriculture (11%). While there are a growing number of women in the public service, men dominate the most senior positions.

Table 2: Unemployment Percentage by Gender, Age, and Education

Age Group	Total	Male	Female
15-24	58.5	59.2	57.8
25-39	31.4	24.9	39.1
40-59	17.7	12.4	25.7
60+	3.1	1.6	5.6
Education			
Primary or less	37.8	33.3	44.2
Some secondary	41.9	34.9	49.9
High school graduate	28.2	21.8	35.8
Some college or more	16.3	13.8	19.6

Source: RMI Government data

Health Services

The vast majority of health services in the RMI are provided by the government, with only a small number of private providers. There are two hospitals and 58 health centers in the Marshall Islands. Providing equitable access to affordable health care is a major challenge for the government. In 2012, 94% of rural women and 79% of urban women reporting problems in accessing healthcare, regardless of age, number of children, education, or wealth quintile.[3]

High population growth and crowded conditions in urban areas has caused the re-emergence and/or rise of certain non-communicable diseases (NCDs) such as tuberculosis and leprosy. Diabetes-related diseases and cancers are now the leading causes of death in the country, largely attributable to sedentary lifestyles and high intake of processed foods. RMI adults have one of the highest rates of diabetes in the world, with an estimated 28% of individuals over the age of 15 having Type 2 diabetes. For those older than 35, the figure is nearly 50%. Close to 75% of women and more than 50% of men in the RMI are overweight or obese[4].

Women living in the outer islands face additional health challenges if they require professional obstetric or gynecological care, which are only available in the urban centers. This is particularly a problem during times of water stress due to limited sanitation infrastructure and awareness of proper WASH practices[5].

Food poverty affects all levels of Marshallese society. The atolls are limited in the food crops that they can produce, and the low daily wage ensures that affordability of imported food for nutritious comprehensive diet in difficult to attain. The leading causes of morbidity in the RMI include child birth-related conditions, pneumonia and diabetes. The major causes of infant mortality are sepsis, malnutrition, pneumonia, drowning and prematurity, while severe malnutrition, bacterial meningitis, gastroenteritis, and pneumonia accounted for most childhood mortality.[6] Another area of concern is the low level of immunization coverage.

Childbearing starts early in the Marshall Islands and is nearly universal for Marshallese girls and women. Although fertility rates have declined from 8.7 in 1964, the average fertility rate (FR) remains high at 4.1 births for woman of reproductive age. The rate of teenage pregnancy in RMI is one of the highest in the Pacific at 20.6% of live births. The rate of sexually transmitted infections (STIs) has also risen, which serves to threaten the health of young people as well as the nation as a whole.

[3] MIA, 2014.
[4] Draft PDNA Report, 23 Sept 2016
[5] IBID.
[6] EPPSO, 2012

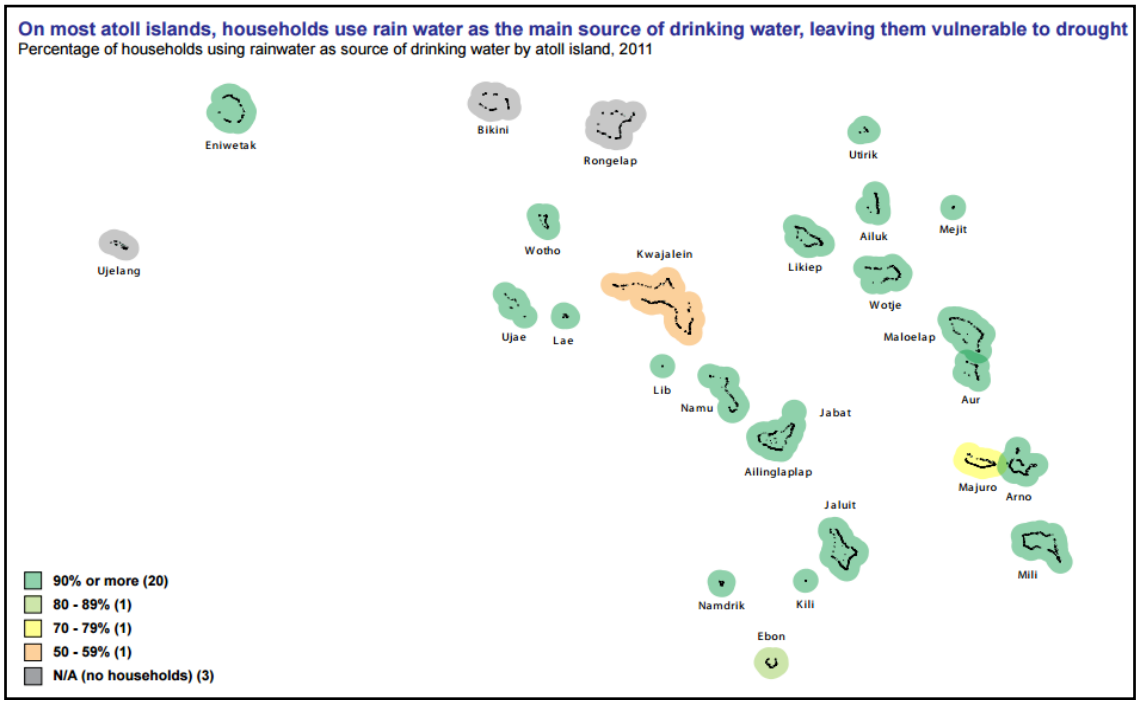
Another water-related health issue affecting women and adolescent girls is inadequate menstruation hygiene management (MHM). Recent research conducted by the "Cookhouse Confidential" (a consortium of women representing a wide range of state and non-state agencies concerned with gender issues in the RMI) identified cultural practices surrounding menstruation that effect women and girls particularly in times of drought and disaster.

Access to Clean Water and Sanitation Facilities

Access to water and sanitation are fundamental to human life and are now recognized as human rights by the UN General Assembly. Globally, the lack of access to clean and sufficient water contributes to death and illness; with children being particularly vulnerable. Access to safe water has proven crucial to reducing mortality and morbidity in children under five, especially the reduction of diarrheal diseases.

As shown in Figure 1, most households on outer atolls and islands rely on rain water as their only source of drinking water, leaving them highly vulnerable to the effects of droughts. Figure 2 shows that only about 25% of outer island households have access to toilet facilities. As outlined in Section 4, community consultations indicate that this number may be even higher in some rural areas.

Figure 1: Percentage of Population using Rainwater as Primary Source by Atoll islands



Source: 2011 RMI Census of Population and Housing, EPPSO

Gender Equity in Education

The RMI Ministry of Education (MOE) oversees delivery of public education from Kindergarten through Grade 12. While a number of private schools also operate in the RMI, the vast majority of children attend public schools. 2011 Census figures indicate continuing concerns with educational outcomes. For example, 28.6 % of people aged 25 or older had started but not completed high school. School enrolment figures also show that significant numbers of school-age children are not in school (20 % of children aged 5-9 and 62 % of youth 15-24)[7].

Table 3: RMI Education Statistics

[7] EPPSO, 2012

Education		
Total enrolment - Primary	10,281	2005
Male (%)	5,369 (52.2%)	2005
Female (%)	4,912 (47.8%)	2005
Total enrolment - Secondary	3,018	2005
Male (%)	1,523 (50.5%)	2005
Female (%)	1,495 (49.5%)	2005
Total enrolment - Tertiary	260	2005. College of the Marshall Islands.
Male (%)	143 (55%)	2005
Female (%)	117 (45%)	2005
Total completion rate	55%	2001 - 2005
Male completion rate	52%	2001 - 2005
Female completion rate	60%	2001 - 2005
Total Number of Schools	81	
Total schools with toilets (%)	64	2016

Source: 2011 RMI Census of Population and Housing, EPPSO

Overall, the highest level of education attained by girls is lower than that of boys. In 2011, 47% of adult men aged 25 years and over had completed high school or higher education compared with 39% of adult women[8]. School enrolment statistics show nearly equal enrolment of males and females (girls comprise 49% of elementary students and 51% of secondary students), net enrolment rates point to higher enrolment of girls than boys especially at secondary school level. While attendance rates disaggregated by sex are not available, overall absentee rates for 2015 are 12 % for Majuro and Ebeye, and 3 % for the outer islands[9].

In the RMI, Technical Vocational Education and Training (TVET) is administered by the Ministry of Education through secondary-level TVET programs and by the College of the Marshall Islands (CMI) and the University of the South Pacific (USP). TVET programs play an essential role in fostering economic development through skills development in response to the needs employer needs. The 2015 RMI *Training Needs and Gaps Analysis* report notes that *"employers consistently reveal their dissatisfaction with the number and quality of applicants for position vacancies in the formal economy[10]".* In this regard, the 2014 *Education for All in the Republic of the Marshall Islands Report notes the* need to increase of female enrolment in TVET programs, revitalizing TVET in secondary schools and ensuring that TVET programs are responsive to the needs of employers.

Gender Based Violence

In addition to the gender differential in employment and governance spheres, the *National Gender Mainstreaming Policy* states that the very high rate of gender-based violence in the country poses a major barrier to achieving social and economic development goals. Violence against women and girls in the Marshall Islands "is alarmingly high" with 51% of women experiencing intimate partner physical and/or sexual violence in their lifetime.[11] Attitudes about domestic violence, from the perspective of both men and women serve to perpetrate the prevalence of domestic violence, with 85% of women agreeing domestic violence is justified under certain circumstances.[12]

It has been well established by global experts that the vulnerability of people during and after disasters varies significantly according to their class, ethnicity, gender, disability and age. There is also a "devastating amount of research that shows that disasters reinforce, perpetuate and increase gender inequality, making bad situations worse for women"[13]. Extreme weather events also result in more short and long-term emotional trauma and mental health problems, including: post-traumatic stress disorder, depression, sleep difficulties, social avoidance, drug or alcohol abuse.

[8] EPPSO, 2012.
[9] EPPSO, 2012
[10] *Republic of the Marshall Islands Training Needs and Gaps Analysis.* European Union: Pacific Technical and Vocational Education and *Training Project. Helene Jacot des Combes, August 2015*
[11] National Gender Mainstreaming Policy 2015-2019 of the RMI
[12] Draft 2016 PDNA Report
[13] http://www.foei.org/news/how-climate-change-may-lead-to-an-increase-in-violence-against-women

In 2011, the RMI government enacted the *Domestic Violence Prevention and Protection Act* and established a Domestic Violence Prevention and Protection Task Force (DVPPA), administered by the Secretary of the Ministry of Internal Affairs to support implementation of the law and make recommendations for actions required and to coordinate resources.

In 2013 and 2014 the RMI government conducted a Family Health and Safety Study however this research did not specifically examine the impacts of emergency situations and changing climate conditions on family violence. As such, this is an area where further analysis is required.

Recent research findings on child protection in the RMI which found that there is limited knowledge within communities about dealing with the impacts of climate change on children (who make up about 40 % of the population) and are most vulnerable to disaster impacts[14]

Women and Governance

At national level, the participation of women in legislative and executive branches of government remains unbalanced: three women currently serve as members of the thirty-three seat *Nitijela* (parliament). Local government in the RMI is administered by the Ministry of Internal Affairs (MIA). Each inhabited atoll/island has a local council headed by a mayor. The mayor is chosen by council members who themselves are elected to office every four years. Individual islands are represented in the Atoll Local Government by a councilman who is representing the interests of the respective inhabitants. Local governments are responsible for the passage of regulations and ordinances that affect their atoll and play a major role in the community. Local council activities include: local police services, solid waste collection, and maintenance of local roads. Funds are disbursed to the local councils on an annual basis in relation to the size of the population being served. Mayors report back to the MIA every three months.

In addition to the local government, traditional leaders are responsible for many decisions affecting the community. The *Iroij* (chief) and *Alaps* (traditional landowners) have significant influence in governance and decision-making processes though the governance mechanisms are strongly influenced by the large amount of people migrating to the urban areas from the coastal islands. While women have the right to sit on the *Council of Iroj* (which serves a largely consultative function on matters of custom and tradition) the practice is that sisters designate their brothers to represent the family; three of the twelve seats on the *Council of Iroj* are currently occupied by women[15].

As outlined in the *National Gender Mainstreaming Policy*, the *National Disability Inclusive Policy* and verified through the results of the 2016 PDNA Gender Assessment and 2016 community consultation processes, women and people with disabilities remain marginalized from planning and decision-making processes at all levels.

Mechanisms to address gender inequality in Marshall Islands: legal and administrative frameworks

Marshall Islands National Strategic Development Plan Vision 2018

RMI's national strategic directions are articulated in two connected development plans: i) the *Strategic Development Plan Framework 2003-2018 Vision 2018*, and (ii) the *National Strategic Plan* (NDP) *2015–2017* which both support a human rights approach. With respect to the ACWA, *Vision 2018* expresses the Government's to ensure that all citizens of the RMI have access to clean and adequate water resources, in order to achieve hygiene and sanitations levels equivalent to world standards.

The NDP is supported by various Master Plans that direct the work of RMI ministries and statutory bodies. NDP priority sectors are: education, health, environment (including climate change), infrastructure development and maintenance. Of direct relevance to this project are NSP strategic

[14] Ibid
[15] National Gender Mainstreaming Policy 2015-2019 of the Republic of the Marshall Islands

areas: i) Environment, Climate Change and Resiliency, ii) Infrastructure Development (water and sanitation), and Social Development (gender and vulnerable groups).

Republic of the Marshall Islands National Climate Change Policy Framework

The *RMI Water and Sanitation Policy and Proposed Action Plan* approved in 2014 and formalized as a legal instrument through the National Environmental Protection (Amendment) Act in 2016, serves as the foundational framework for climate-resilient water sector development at national and sub-national levels. This Policy includes 5 strategic goals and a series of targets and strategies related to each goal. Policy Statement 4 is to: *"Target service improvements at the disadvantaged"*[16]. The Policy also:

GESI strategies are also included in other Policy areas and objectives. For instance, Objective 3.2: Water Supply and Sanitation Service Management indicates that *"designed and constructed infrastructure will be accessible to the widest number of user including the elderly, disabled, very young and pregnant women." The National Water and Sanitation Policy* also includes a series of GESI strategies under Section 1.2 *Social Marketing Campaigns* and Section 4.2 *"Behavior Change for the Disadvantaged"* that are relevant to the project design.

Marshall Islands National Climate Change Policy Framework

The purpose of *the Marshall Islands National Climate Change Policy Framework* (NCCPF) is to set out the strategic priorities for scaling up the government's commitments to address climate change, both in terms of current and future vulnerabilities. This policy promotes a coordinated approach to reducing projected climate-related risks that can lead to loss of life, economic disruption, environmental and property damage and increased poverty in vulnerable groups.

The NCCPF is premised on the Government's belief that RMI's people are extremely vulnerable to the impacts of climate change, hence the urgent need to "*implement measures to build resilience, reduce disaster risk, and support renewable energy and energy efficiency*".

National Gender Mainstreaming Policy of the Marshall Islands 2015-2019

The goal of the RMI National Gender Mainstreaming Policy is to progress gender equality and empowerment of women, including in decision-making processes, political participation in local governments in the outer islands.

A 2010 "Stocktake" analysis[17] on the capacity of the Government of the RMI to mainstream gender concluded that:

- Gender issues are rarely mentioned in high-level discussions;
- Very few sectors were using gender disaggregated data;
- Gender analysis was not used in policy and program development processes;
- There was no accountability or reporting measures related to mainstreaming gender in the government;
- Resources allocated to addressing gender issues were largely insufficient, and
- There was very limited technical capacity to conduct gender analysis and support the gender mainstreaming approach.

Climate change resilience and water security are key priorities for RMI, and critical to achieving various government policies and strategies for sustainable and equitable development, including Vision 2018, National Climate Change Policy Framework (NCCPF), the Joint National Action Plan (JNAP) for Climate

[16] For the purpose of this policy, disadvantaged people are defined as: i) households or communities with nil or limited access to improved and sanitation conditions; ii) those living in or with extreme poverty, severe disability due to age, disease, injury or other causes; iii) disaster or conflict affected households; iv) those with significantly adverse ground conditions, and v) those with lack of space for private facilities.

[17] Stocktake of the gender mainstreaming capacity of Pacific Island governments – Republic of the Marshall Islands. Secretariat of the Pacific Community, 2012.

Change Adaptation and Disaster Risk Management, RMI Water and Sanitation Policy and Proposed Action Plan and the National Environmental Protection (Amendment) Act, and the National Gender Mainstreaming Policy with a Policy Strategic Plan of Action for 2015 – 2019.

III. Literature Review: Impacts of Climate Change and Water Insecurity on Vulnerable Groups

This section provides a summary of the impacts of climate change and water insecurity on vulnerable groups of people including women and youth. It considers global and national level research findings, drawing from the Pacific and RMI context. It also includes information on international standards related to GESI and CCA/DDR which provide an important frame of reference for proposed project interventions and targets. The section begins with an overview of WASH and the relationship to climate change and vulnerability.

Water, Sanitation and Hygiene (WASH)

The concept of WASH groups together water, sanitation and hygiene because the impact of deficiencies strongly overlaps and therefore need to be addressed together to achieve sustainable development outcomes, especially for women and children. Historically, sanitation and hygiene have received less attention and funding than water security, but this is slowly changing, particularly in view of emerging

The concept of “Institutional WASH” arose through global recognition that focusing on water, sanitation and hygiene issues at household and community level only is not enough to achieve the kind of sustained behavioral changes required for successful climate change adaptation. As such, Institutional WASH considers the availability of WASH facilities:

- ✓ At schools, for both students and teachers, and especially for girls, given that WASH effects attendance and performance;
- ✓ At health centres given the vital need to prevent infection and spread of diseases, and
- ✓ At the workplace, given the need to ensure people are able to work in a healthy and safe environment.

Water and Sanitation in Schools

Global studies reveal that over half of schools built in developing countries do not have adequate water and sanitation facilities. As indicated in this report, when water, toilets and hand-washing facilities are not available in schools in the RMI, absenteeism increases as children spend more time collecting water and tending to personal hygiene needs. In addition to attendance issues, studies - including this assessment confirm a direct link between the availability of water and sanitation in schools and student health, learning outcomes, gender equity, poverty, personal self-worth and dignity.

With respect to current sanitation conditions in schools in the outer atolls and islands of the RMI, the key findings from the GIZ WASH and School assessment conducted in 2016 indicate that:

- ➢ The number of functional toilets and urinals do not meet national standards;
- ➢ There are no dedicated or easily accessible toilets for students with disabilities;
- ➢ Toilets are not configured to privacy and are unsuitable for girl’s menstruation requirements
- ➢ No or inadequate number of hand-washing facilities; seawater is used for hand-washing;
- ➢ Soap is generally not available at schools for student use;
- ➢ Teaching of WASH principles, in particular hygiene practices, at the school is not widespread;
- ➢ There is no budget provided to schools to support for WASH requirements;
- ➢ There is no specific plan for WASH maintenance in schools, including who is responsible for ensuring repairs and providing soap and other consumables.

Stakeholder consultations with students in outer atolls and islands of RMI verified that these findings are equally relevant at the additional schools consulted.

Children

Using the four sets of rights set out in the Convention on the Rights of the Child (CRC) as a guideline for assessing climate change impacts on children in the RMI, it is apparent that children's rights are not being fully realized given PDNA 2016 and community consultation findings.

- Survival: Health issues caused by water and sanitation concerns including unsafe drinking water and water borne diseases; and nutrition issues stemming from insufficient or poor-quality food;
- Development: Decreases in school attendance and educational attainment due to weather induced access issues; school closure due to lack of water; lack of water and natural disasters;
- Protection: Child protection issues related to overcrowded housing, very high levels of violence against women and high urban migration;
- Participation: Children becoming more aware of potential impacts of climate change on their lives and futures but limited opportunities for involvement in decision-making or participation in adaptation initiatives.

The 2011 *Children's Charter for Disaster Risk Reduction*, which had extensive input of from children worldwide, calls for a stronger commitment from governments and development partners to provide safe schools, to protect children before, during and after disasters, to meet the right to safe community infrastructure, and to support children's rights to participation in disaster risk reduction programs. Beyond the identification of vulnerable populations, a "child-centred approach" to disaster risk reduction fully engage children by involving them in adaptation processes, including needs identification and strategy development.

Women

Women in the Marshall Islands and other Pacific countries generally bear the double burden of productive and reproductive activities – all of which are significantly impacted by climate change. Reproduction activities include domestic responsibilities such as tending to home gardens, cooking meals, caring for children and the elderly, cleaning etc. As droughts and storms intensify, these resources become scarcer and women often have to travel further in order to collect enough food, water and other resources for their families. In fulfilling these duties, women may not have enough time to engage in income-generating activities or to take on extra roles in their communities. These extra time burdens can have serious social and financial implications for women and lead to exacerbating gender inequity in households and communities.

IV. Summary of Relevant Findings from 2016 PDNA

To assess the socio-economic impacts of the 2015-2016 drought, and to assist in mobilizing resources needed for recovery, the Government of RMI requested that a Post-Disaster Needs Assessment (PDNA)[18] be conducted. Given that a full PDNA would be a challenge for agencies already working at capacity to support recovery efforts, a 'rapid socio-economic assessment' (RSEA) was conducted rather than the more comprehensive PDNA. It was intended that the RSEA would form the basis of the Drought Recovery Strategy to be managed by the Government of RMI.

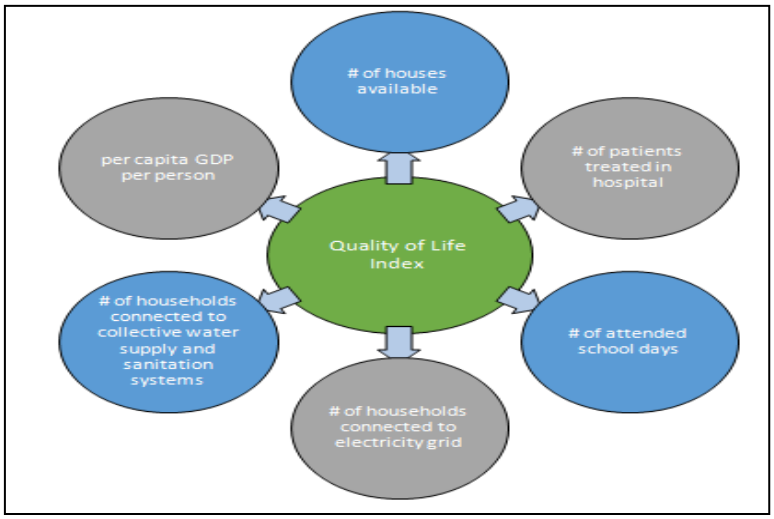
While PDNAs have been conducted for droughts in other parts of the world, this was the first such assessment following a drought in the Pacific region. As such, conducting this RSEA provided a highly value learning opportunity for other drought affect countries in the Pacific.

The PDNA team assembled following the 2016 drought in the RMI was supported through technical and financial assistance from the European Union (EU), the Pacific Community (SPC), the United Nations (UN) and the World Bank Group, who were assisted by a significant number of stakeholders from a host of national government and non-governmental agencies. The results of this assessment are based on a comprehensive literature review and consultations with over 150 residents of drought effected communities throughout the RMI.

The Draft PDNA Report indicates that the 2016 drought affected a total of 53,158 people (or 7,738 households) across the RMI and created significant negative consequences in all sectors as outlined in the Feasibility Study. The following sections overview PDNA findings with respect to quality of life and gender equity and social inclusion impacts relevant to the project design.

In addition to negative economic impacts, the 2016 drought also caused a decline in the quality of life and wellbeing of affected households and communities based on the application of a Quality of Life Index. This index is composed of six equally weighted indicators (see Figure 3) that are assessed prior to the disaster, immediately after the disaster, and periodically during the recovery and reconstruction process.

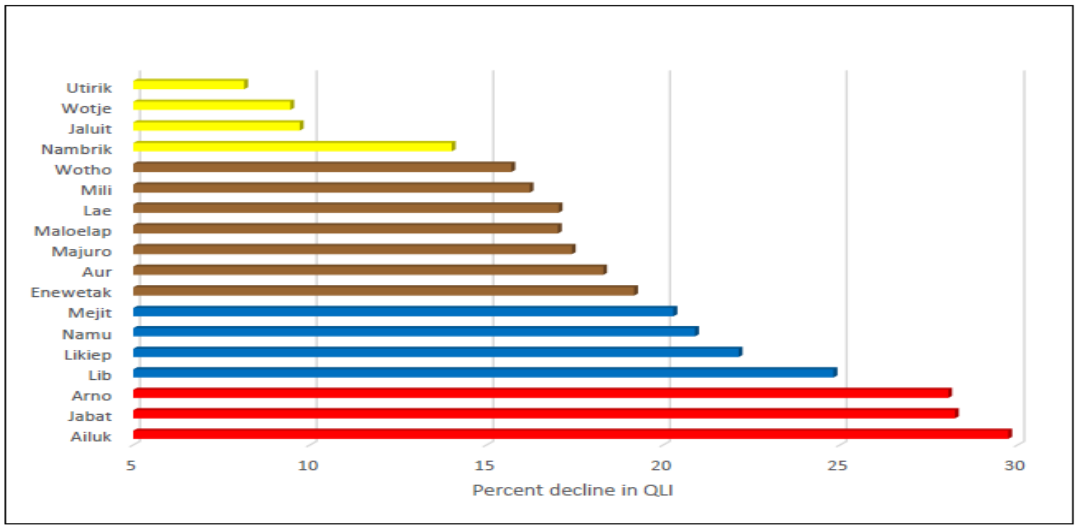
Figure 3: Quality of Life Weighted Indicators Used in 2016 PDNA Assessment



The atolls and islands most affected by the 2016 drought in terms of quality of life indicators are shown in Figure 4.

[18] The PDNA is an approach to analyzing disaster effects and impacts for the purpose of identifying recovery needs, as they are understood from human, socio-cultural, economic and environmental perspectives. A unique aspect of the PDNA is that it is led and owned by the government of the affected country with assistance from a multidisciplinary, multiagency team. Under the PDNA methodology, assessment of the disaster effects is based on a bottom-up approach, captures information about the effects of the event sector by sector, and aggregates the data to determine the event's total effects on society and the economy. Assessment of disaster effects is based on the quantification of damage and losses.

Figure 4: Most affected atolls/islands based on decline in quality of life index



According to the PDNA Assessment the three atolls most affected by the 2016 drought were:

- Ailuk Atoll was the most affected decline in the QLI composite index (30%), which results from the combination of a 47% decline in the health index, a 43% decline in the access to water supply index, a 1% in education index, and a 15% decline in personal income index.
- Jabot Atoll was the second most affected location in composite quality of life index decline (28%), arising from the combination of the highest deterioration in the health index because of increased morbidity rates (64%), the highest decline in personal income (28%), and a 20% decline in access to water supply.
- Arno Atoll was the third most affected (28% decline) stemming from the combination of a 56% decline in access to water supply, a 29% decrease in the health index due to increased morbidity rates, and a 16% decline in personal income.

Key PDNA Quality of Life Findings

1. *Reduced food supply*

Many families in the RMI, especially in the outer islands, produce a significant proportion of their own food, notably fish, traditional tree crops like coconut, breadfruit and pandanus and other crops such as bananas and taro. During the drought fishermen reported that they had to go further to get their normal fish catch, resulting in more time spent fishing. Most atolls and islands reported the total loss of local crops and traditional medicines. Many reported having to change from their 'traditional' diet to relying on imported goods and canned food.

2. *Reduced family income and increased costs*

The 2016 drought reduced family income from handicraft sales because of the lack of required input supplies (i.e., pandanus, coconut, vines etc.). In addition, there were increased costs associated with securing potable water for drinking and purchasing food due to the reduced supply of agriculture and fisheries products. Low income families were faced with difficult and stressful decisions about spending their limited incomes for water rather than on needed purchases. At the same time a number of community groups were fund raising for conferences with one women's group tasked to fundraise as much as USD 16,000 while other groups reported lower values of around USD 5,000. This is on top of the activities like bingo evenings, with key respondents in

Majuro noting that during the drought there was an increase in potential winnings; perhaps to entice more people to participate.

While incomes from copra actually increased during the 2016 drought because of the acquisition of copra by Tobolar on a more frequent basis to a wider range of atolls, copra processing plant figures do not reveal the inconsistencies in copra collections from outer islands and number of households able to sell their copra during each collection trip. For example, Ailinglaplap Atoll had four pick-ups in FY 2015, which increased to seven pick-ups in FY 2016. This collection schedule implies that families might or might not have received income from copra prior to the drought, comprising their ability to prepare for the drought when warnings were issued.

3. *Increased time and work burdens*

All family members reported an increased burden in terms of normal household roles and responsibilities. For example, a wife and mother of three reported spending three extra hours a day collecting and fetching water during the drought; while a young man from Arno spent two hours a day collecting his family's drinking water from the RO unit some distance away. This research revealed that although it is usually men (including young men) who usually collect drinking water because of their physical strength; when water supplies were at their lowest levels whole families would go to the water stations to collect and carry as much water as they could. In the case of female headed households, these women had to rely on family members, friends and neighbours for their drinking water.

4. *Negative impacts on children's education*

Due to the need to assist with collection of drinking water each morning; lack of drinking water and sanitation in some schools; closure of some schools' due to water issues; non-attendance due to insufficient water to bathe and/or wash school uniforms, and general *"lassitude related to the high temperatures and insufficient drinking water".* Drought-induced disruption to education is especially significant given that the RMI is already struggling with low educational attainment rates and an insufficiently skilled labour force.

5. *Increased disease*

The drought worsened seasonal disease outbreaks, notably the prevalence of conjunctivitis (pink eye), diarrhea, influenza and scabies.[19] This assessment revealed that children with malnutrition treated in hospital increased by almost five-fold; implying the overall level of child malnutrition may have substantially increased. Given that women are largely responsible for the health and wellbeing of their family, especially children, the elderly and people with disabilities, increased disease prevalence served to increase time and care burdens for women.

6. *Increased morbidity and malnutrition*

In view of changing climate and environmental conditions brought about by the drought, the 2016 PDNA identifies the likelihood of increased morbidity and malnutrition due to the decline in food availability caused by crop failure, especially among vulnerable population groups including pregnant and lactating women and people with chronic diseases.

[19] Based on the information from the incidence of drought related diseases in 2016 and the years previous, the drought related disease burden was especially high for families living in Aur, Jabat, Lae and Mili in terms of the proportion of households affected by the incidence of one or more of these diseases. In 2011, 25 % of households in the island of Lae had a female household head, and these households would have felt the cost of care even more acutely. Breastfeeding mothers reported drinking between five to eight cups of water a day during the drought, which they considered adequate and is consistent with compensation of water lost through milk which is estimated at 600 to 700 mL/d (Hydration for Health, 2016). In 2007 children were tested for signs of malnutrition and it was found that 17 % showed signs of malnutrition, and overall 13 % were observed to be malnourished after various tests and targeted observations. Malnutrition was more prevalent in the outer islands (rural areas) than in urban areas (DHS, 2007).

V. Summary of GESI Findings from Community Consultations

The results of the project design community consultation process summarized in this section are presented according to the thematic categories used in data collection (i.e., questionnaire and community focus group discussions). Survey categories included: water supply, water collection, water quality, water management; sanitation issues and impacts on community well-being.

It should be noted that project design community consultation results represent the views of the 1,280 stakeholders[20] and therefore may differ from official RMI government statistics and other research results. The intention of the community consultation process was *not* to provide a comprehensive quantitative assessment of water and sanitation services in all target communities, but rather to solicit the views of a sample of women, men and youth and children residing in targeted areas with respect to the adequacy of water and sanitation services and the impact this has on their lives.

Women and Men's Consultations

Water Supply: Household Level

- Table 4 shows that 95% of households in the areas consulted reported that they get their water from household rainwater tanks during normal weather conditions. During times of drought, only 44% said water they get water from household rainwater tanks.

Table 4: Sources of Household Water Supply

Q 1: Where does the community get their water from?

Water Supply During Normal Weather Conditions			
	Well	**Rain Tanks**	**Total**
Sub Total	**2**	**42**	
Total		**44**	
%	**5%**	**95%**	**100%**
Water Supply During Droughts			
	Well	**Rain Tanks**	**RO only**
Sub Total	**4**	**20**	**2**
Total			
%	**9%**	**44%**	**4%**

- As shown in Table 13 the primary concern of all stakeholders consulted is the lack of rainwater catchment at household and community level – including schools and health care centres. The vast majority of people consulted indicated they are highly dependent on rain water harvesting and supplies are inadequate prolonged during dry periods.

[20] Inclusive of 695 women, 132 female students, 385 men and 68 male students residing in 22 Atolls, 36 Islands and 26 villages in targeted communities.

Figure 5: Household Water Supply During Normal Weather Conditions

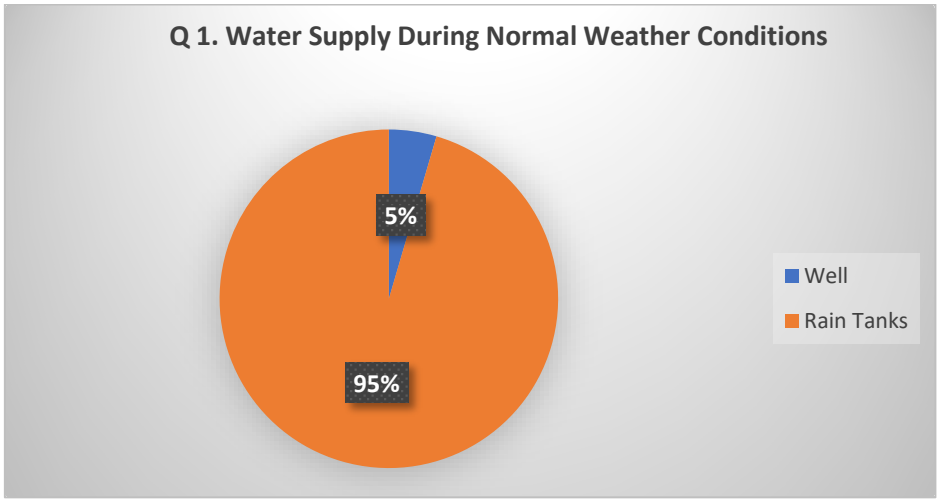
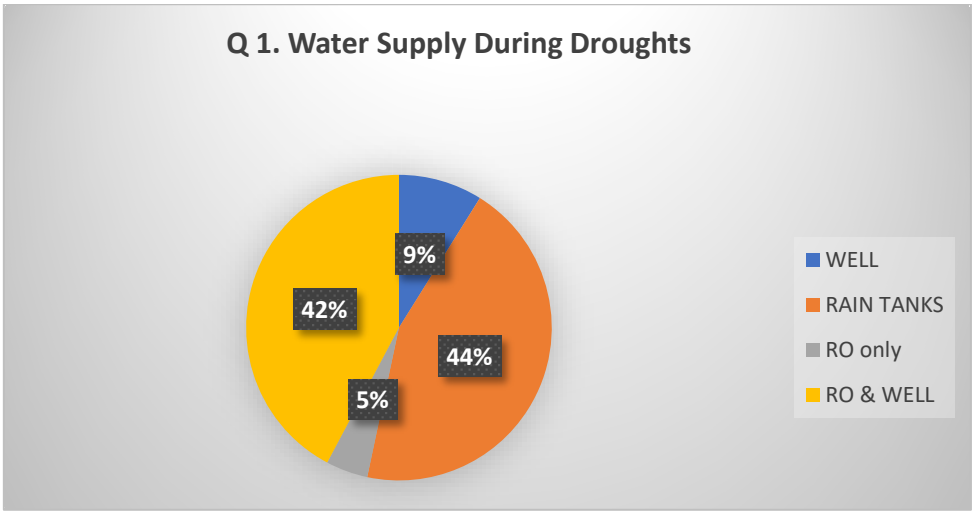


Figure 6: Household Water Supply During Periods of Drought

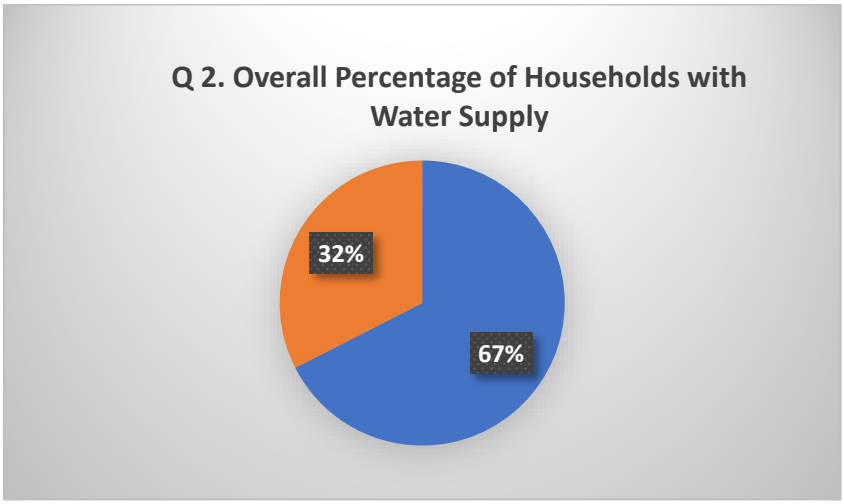


- In response to the question regarding household water supply, respondents estimated that 67% of households in their community have water supply while 32% do not have household access.

Table 5: Household Access to Water Supply

Q 2: Does everyone in the community have a household water supply?		
Overall Percentage of Households with Water Supply		
With	**Without**	**Total**
67%	**32%**	**100%**

Figure 7: Estimated Percentage of Households with Water Supply



Water Supply: Community Level

- Table 6 shows public water sources available in the communities consulted.

Table 6: Type of Community Water Sources

Q 16: What public water sources are available in the community (excluding household level)?				
	Well	**Tank**	**RO units**	**Total**
Sub Total	2	24	16	
Total				**42**
%	**5%**	**57%**	**38%**	

- The majority of public water supplies are located at community centres and churches, with fewer numbers at health care centres, airports and schools.
- Of significant concern, about 40% of public water sources were reported to be non-functioning as shown in Table 7.

Table 7: Condition of Public Water Sources

Q 16a: Condition and Quality of water from this source?				
	Working	**Not Working**	**Polluted**	**Total**
Sub Total	24	17	1	
Total				42
%	**57%**	**40%**	**2%**	**100%**

- When asked if there is a current water shortage in the community, 68% of respondents believe there is.
- When asked where additional public water supplies should be located, respondents stressed the need to identify accessible locations, close to housing and schools, that would be accessible to all members of the community, regarding of who owns the land. While locating water tanks at churches was also suggested by numerous respondents, concern was also raised that people who do not attend that church would have no or restricted access.

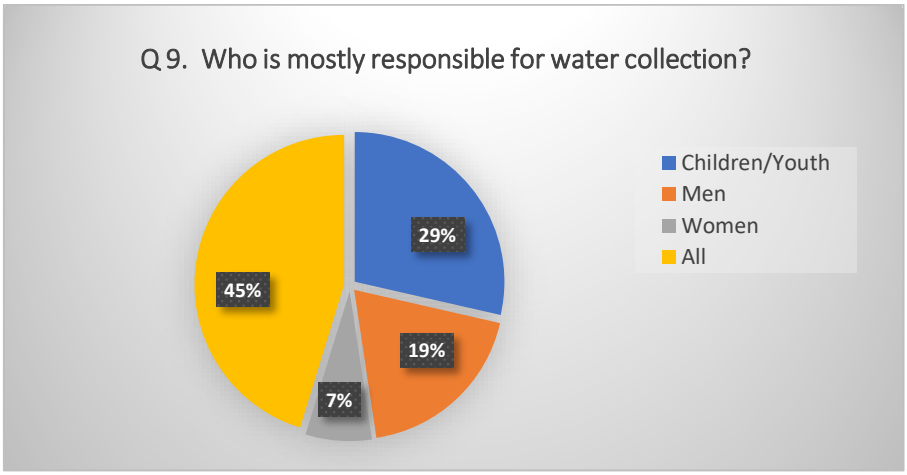
Table 8: Respondent Perspective on Current Water Shortage

Q 4: Is there a currently a water shortage in the community?			
	Yes	No	TOTAL
%	68%	32%	100%

Water collection

- ACWA community consultations revealed that the responsibility for water collection is widely dispersed within families as shown in Figure 8.

Figure 8: Responsibility for Water Collection in Families Consulted



- However, stakeholders consulted also said that during droughts men and older male children take more responsibility for queuing up at the portable RO installations and community catchments due to people's increased work-loads and tensions within the community that can lead to safety and security issues.

Safety

- Almost 60% of respondents, including men, women and youth raised concerns about safety en route or at water sources. These issues included stealing, fighting and harassment. In response to the question about whether action had been taken to resolve security issues, about 30% indicated action had been taken place but they did not indicate what this involved. About 84% of respondents indicated that safety issues have *not* been resolved or made no comment in response to this question. Only 10% of men and 6.7% of women indicted that safety issues have been resolved.

Water quality

- In response to the question about whether people think their water is safe to drink, 56% of respondents indicated "no" or "sometimes", while 44% of respondents believe their water is safe to drink.

Table 9: Respondent Views on Safety of Drinking Water

Q. 11: Do you think your water is safe to drink?			
	Yes	No	Sometimes
Sub Total	19	9	15
Total			
%	44%	21%	35%

- When asked whether people get sick from consuming the water, about 60% said "yes" - of these the majority are children. The most common illness attributed to poor water quality were stomach aches, eye problems, diarrhoea and skin disorders. While the majority of respondents said they usually seek medical treatment for these aliments, the reasons people don't seek treatment include transportation difficulties, "*goes against custom*", "*because we are ashamed*" and lack of medical facilities and supplies.

Water treatment

- ***Boiling:*** 46.5% of all respondents indicated that they never boil water from tanks before drinking while 46.5% said they sometimes do. The remaining 7% said they always boil water from rain tanks prior to consumption (primarily respondents from Rongrong, Mejatto and Ronglap). About 71% of all respondents indicated they never boil water used for food preparation; 14.6% they "sometimes" do, with about the same number of respondents indicating they always boil tank water used to prepare foods (primarily people living in Rongrong and Lib). About 56% of all respondents indicated they never boil groundwater; 18.6% said they "sometimes" do, while 25.6% said they "always" boil groundwater for drinking.

- ***Filtering:*** In response to questions about filtering water for drinking purposes, about 51% of all respondents indicated they never filter water from rain tanks; about 30% said "sometimes" and.21% said they always filter water from rain water tanks prior to consumption (primarily respondents from Maloelap, Tarawa, Airok, Wollot, Jeng, Mejit and Likiep.). With regard to filtering rain water for food preparation, about 62% of respondents said "never"; 21.4% said "sometimes" and 16.7% said "always" (mainly people from Maloelap Airok, Jeng, Mejit, Likiep, Ebadon. Lib, Jabot). With regard to groundwater, about 79% of all respondents indicated they never filter ground water for drinking; while 21% said they "sometimes" do. There was relatively the same response to the question on filtering ground water for food preparation purposes.

- ***Cleaning Agents:*** In response to questions about whether people add any type of disinfectant to rain tank water prior to drinking, about 44% said "never", 40% said "sometimes" and 26% said "always" (primarily respondents in Lae Ailuk, Likiep p, Ujae Uae, Mejatto Kwajalein/Ronglap). In terms of treatment of groundwater used for drinking, about 72% indicated they never add disinfectant; 16% said sometimes and 12% said always (respondents from Lae, Aur, Mejit, Kwajalein Ebadon). With respect to adding cleaning agents to water used for food preparation, about 58 % of all respondents indicated they never add disinfectant to tanks water; 23% said "sometimes" and 18.6% said 'always' (primarily respondents from Lae, Ailuk, Likiep, Ujae Uae, Mejatto Kwajalein/Ronglap). About 77% of all respondents indicated they never add disinfectant to groundwater for food preparation,14% said sometimes and 9.3% said "always" (primarily respondents from Lae , Mejit, Ebadon).

Water management

- As shown in Table 10, household level decision-making on water use seems to be largely shared between women and men (76.2%). However, in cases where one gender was specified as the primary decision-maker, men play this role about 4% more often than women. At the community level, all respondents indicated that men are the sole decision-makers. While many women indicated this is not a problem as "*we have our say even though we don't say it around other men, our husbands know what we want".* However in some cases, women's focus groups indicated that they were displeased with this arrangement.

Table 10: Water Management Decision-Making by Gender at Household and Community Level

Gender	Who makes decisions re water use at household level?	Who makes decisions re water use at village level?
Men	**12.5%**	**100%**
Women	**8.3%**	**0%**
Both	**76.2%**	**0%**

- These finding have significant implications for the design of the ACWA project. In order to ensure that water governance and management arrangements at community level are gender inclusive, specific strategies will need to be developed and implemented.

Sanitation and hygiene

- As shown in Table 11, community stakeholders reported a number of sanitation impacts when water supply is low.

Table 11: Impacts of droughts on sanitation and hygiene

Impacts on sanitation during water shortages	% of Respondents
Less water to wash	14.3
Sanitary issues	42.9
Never wash	14.3
Toilets don't work	14.3
Schools closed due to lack of water	14.3

- Although a question was asked regarding the number of households with/without toilet facilities, it is not possible to provide an accurate count as people seemed reluctant to answer this question, gave vague answers or provided percentage responses without indicating the number of households included in calculations.

  However, in all locations visited, respondents indicated that people often use the bush or beach for toileting purposes. When asked if this practice creates any difficulties for the community, over 72% said "yes". The primary issues identified were pollution, increased flies, unsanitary conditions and spread of disease.

- When asked where additional toilets would best be located, 65% of respondents indicated churches and schools.

Menstruation Hygiene Management (MHM)

- Although all female respondents were asked questions regarding the impact of water shortages and availability of sanitation facilities on menstruation, very few responses were received. This is most likely due to cultural taboos and discomfort in discussing this issue in the public domain – perhaps on the part of both the researchers and the respondents.

- Of the responses received to questions regarding MHM issues, 11 focus groups indicated that water issues have a negative impact on school attendance and performance during menstruation; 7 groups stated that health problems arise due to inadequately water during menses; 6 groups stated there are cultural restrictions related to water use by women and girls during menstruation such as not being able to prepare food, be around certain family members or access water from wells and sometimes other locations.

- Some male focus groups also discussed MHM issues, and confirmed the cultural restrictions facing women and girls during their menses. For example, they are "n*ot allowed to get water from the well"* and so "*can't keep themselves clean*". One man commented that "*no clean, no go around"*.

Livelihoods

- The primary source of income reported by all communities surveyed was copra, with handicraft sales being the secondary source of cash. In response to the question regarding total household income (from all sources) in an average 3 month non-drought period, 65% of households were said to earn between $200-$400; about 16% were said to earn between $400- 600 and the remainder earn anywhere from less than $200 to over $1500. In response to the question regarding total household income (from all sources) in an average 3 month

drought period, incomes were said to drop by at least 50% across all areas. There were no significant differences in the figures provided by women and men or by location to either of these questions.

Education

- As shown in Table 12, over 91% of community stakeholders consulted indicated that there are negative impacts on education when water supply is low. The primary consequence reported were reduced attendance caused by sickness and school closures (about 82%) followed by poor performance (about 34%).

Table 12: Impacts of drought on education

Are there any impacts on school(s) when water supply is low?	% of Respondents
Attendance	82.2%
Low grades	34.1

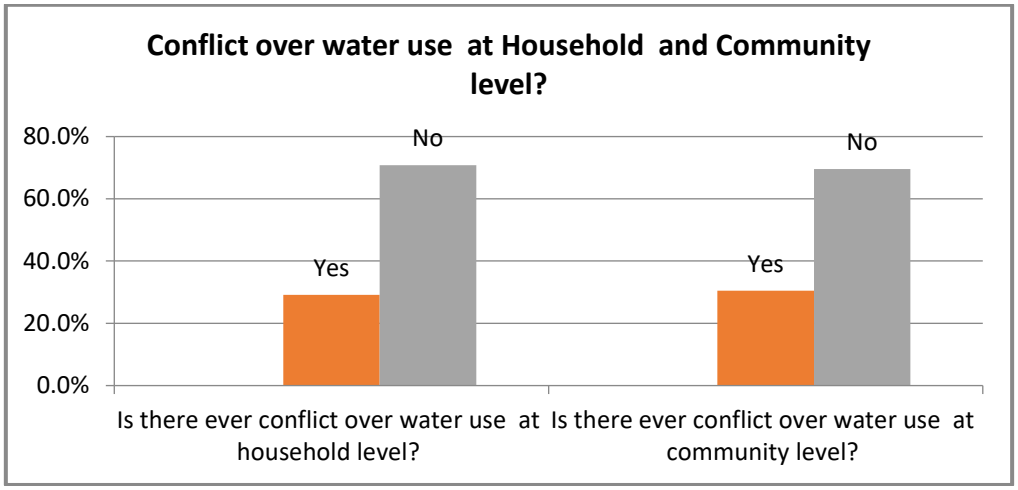
Migration

- In all communities surveyed, a total of 164 families were reported to have relocated over the past five years. The majority of these families moved to the USA, the remainder were have relocated to Majuro or Ebeye. Over 80% if these households were said to have relocated to access better education and employment opportunities; about 20% moved due for medical reasons.

Conflict

- Figure 9 shows responses in relation to the question on the presence of conflict within communities and households over water related issues (about 30% said “yes”).

Figure 9: Conflict over Water Issues



- Respondents indicated that water shortages can cause significant tensions within families and communities that have long-term impacts on relationships. People said there are fights over who should have access to public water supplies and not sharing equally. Some respondents also noted longer waiting time (due to lessening availability of safe water); disagreements of the priorities for water use within families, and tensions when public access points were not available to all members of the community – i.e., some denominations were not able to access water located on certain church compounds. Respondents also noted that people are reluctant to ask other households for water because they feel ashamed.

Preferred locations of new public water supplies

- When asked where any new community water supplies should be located, the number one response was churches (60.7%); followed by community centres (13.4%), "central" community location (13.4%) and schools (8.6%). Most comments related to this question revolved around the need to ensure public water sources can be easily accessed by everyone in the community.

Student Consultations

The ACWA community consultation process also included school-based consultations involving a total of 200 students (132 female and 68 male) attending 18 elementary schools and 1 high school[21] in targeted areas. The purpose of these consultations was to solicit the views of students on the adequacy of water and sanitation facilities at their schools and the impacts this has on their education (attendance, performance and attitude) and overall wellbeing

The results of these consultations are intended to augment the findings of the concurrent GIZ *Climate Change Resilience Project* design research on the adequacy of sanitation systems in outer island boarding schools. These consultations, carried out by the WUTMI and MIOF field researchers engaged as part of the ACWA design process, were conducted using a focus group methodology centered around the same survey instrument used by the Climate Change Resilience Project team to ensure consistency of data collected.

The following tables highlight the key findings from ACWA student consultations.

Table 13: Availability of Water at Schools Consulted

Is water available at your school?			
	No	Yes	Total
Sub Total	12	6	
Total		18	
%	67%	33%	100%

Table 14: Adequacy of Water Supply at Schools Consulted

When the water source is working does it provides enough water for drinking, hand-washing & food preparation?			
	No	Yes	Total
Sub Total	15	3	
Total		18	
%	83%	17%	100%

Table 15: Student Views on Water Quality at their School

Do you think that water at your school is safe to drink?			
	No	Yes	Total
Sub Total	8	10	
Total		18	
%	44%	56%	100%

Table 16: Condition of toilets at Schools Consulted

[21] Including Rongrong High School and the Elementary schools located in Aur, Tobal Aur, Airok, Tarawa, Wolot, Jeng, Kaben, Mejit, Ailuk, Utrik, Likiep, Ebadon, Mejatto, Ujae, Lae, Lib and Majken.

Are most (75%) of the toilets at your school working?			
	No	Yes	Total
Sub Total	18	2	
Total		20	
%	90%	10%	100%

Table 17: Separate Toilet Facilities for Boys and Girls at Schools Consulted

Are there separate toilets for boys and girls at your school?			
	No	Yes	Total
Sub Total	14	5	
Total		19	
%	74%	26%	100%

Table 18: Accessibility of School Toilets for Students with Physical Disabilities

Are there separate and accessible toilets for students with physical disabilities at your school?			
	No	Yes	Total
Sub Total	18	0	
Total		18	
%	100%	0%	100%

Table 19: Private Facilities for Girls during Menstruation at Schools Consulted

Are there private facilities available for girls during their menstruation?			
	No	Yes	Total
Sub Total	18	0	
Total	18	0	
%	100%	0%	100%

Table 20: Condition and Availability of Hand-Washing Facilities at Schools Consulted

Do most (75%) hand-washing facilities work at your school?			
	No	Yes	Total
Sub Total	18	1	
Total		19	
%	95%	5%	100%

Table 21: Recent Learning about Sanitation and Hygiene at School

Students have heard about WASH topics in class in the past month			
	No	Yes	Total
Sub Total	16	2	
Total		18	
%	89%	11%	100%

These results highlight the serious issues at the schools visited with respect to water, hygiene and sanitation services and the impact this is having on student attendance and performance.

Children

The primary impacts of water insecurity on children identified during stakeholder consultations included:

- Increases in water borne illnesses such as diarrhea and influenza;
- Water shortages leading to dehydration and skin disorders;
- Decreasing supply of high quality local foods, due to drought conditions, depleted fisheries and the replacement of local foods with by less nutritious western goods like white rice;
- Significant decreases in school attendance and educational outcomes due to lack of water and toilet facilities in some schools;
- Lack of medicines in some care centres resulting in children not being regularly immunized or treated for illnesses in a timely manner, and
- Children are not getting treated for water related illnesses such as s diarrhoea because it has become such a common ailment which has major potential for further health complications for children.

Priority Water and Sanitation Issues and Proposed Solutions

- Table 22 shows the primary water security and sanitation issues identified by male and female stakeholders during the GESI community consultation process. These issues and proposed solutions were synthesized from Section G of the GESI survey form and include responses to Question #30; "*What are the main water and sanitation related problems in your community*?, and Question 31; "*What are the best ways to improve water and sanitation conditions in your community?*

Table 22: Summary of Stakeholder Views on Priority Water Security and Sanitation Issues and Proposed Solutions

Key Issues		Proposed Solutions
1.	Limited or no water storage	Increase water storage facilities at the household level and increase capacity of public water sources
2.	Lack of water supply and quality	Increase water storage, and engage and support EPA to provide their water testing and treatment services to people in the outer islands
3.	No access to water testing and treatment kits	EPA should train communities, including women and provide testing kits to community members
4.	Lack of support from the EPA	Engage the EPA in the project
5.	Increased water-borne diseases	Provide testing/treatment kits; improve hygiene management education, help the Ministry of Health provide better medical services at local health dispensaries
6.	Decrease in economic opportunities and income	Reduce delays in transportation - particularly to pick up copra as it generates the most income for families in the outer islands. Stakeholders suggested the project engage with the Ministry of Resources and Development, the Ministry of Transportation and Communication and the Shipping Company to promote better economic opportunities
7.	Lack of toilet facilities	Construct toilet facilities in public areas that are accessible to everyone, especially for women, girls, children and people living with disabilities.

VI. CONCLUSIONS AND RECOMMENDATIONS

The project design process identified several key water insecurity factors that prevent women, men and children from accessing safe freshwater year round including:

1. *Lack of adequate household and community rainwater harvesting systems in terms of its efficiency (i.e. maintenance and sizing issues) as well as volume;*
2. *Limited of information regarding the availability and quality of ground water which are likely to be contaminated from both organic contaminants and high salinity especially during periods of drought;*
3. *Stationary desalination systems that are limited in locations and / or ineffective due to the high cost and skills required for operation and maintenance;*
4. *Challenges of outer atoll and island sanitation systems that depend on rain water. These systems fail during drought periods and may also contaminate groundwater resources;*
5. *Inequitable access to existing water supplies by all members of the community;*
6. *Limited capacity to pay for high operating costs for solutions provided in urban centres, and*
7. *Limited participation of women and other vulnerable groups in decision-making processes regarding water use and security.*

From a GESI perspective, the inadequate access to safe and clean water resources and sanitation facilities has resulted in the following consequences:

1. *Food insecurity, caused by decreased yields of good quality subsistence crops, loss of livestock, and depleted fisheries stocks; This situation creates additional work for women in gathering and preparing family meals and results in malnutrition which is having a significant impact on children;*
2. *Health problems, leading to increased prevalence of conjunctivitis (pink eye), diarrhoea, dehydration; scabies, influenza-like illness, communicable diseases which are made worse by unhealthy diets during droughts. For pregnant women, young children and other vulnerable groups adverse health impacts can have life-long repercussions;*
3. *Loss of livelihoods, due to reduced yield from cash crops, associated agricultural products (such as handicrafts) and livestock. According to the 2016 PDNA, the single most affected sector by the 2016 droughts was agriculture which sustained a decline in gross production of USD 1.77 million. As articulated during PDNA and ACWA consultations, reductions in family income created stress on families and led to household and community conflict;*
4. *Disruptions in education: Analysis of MOE data revealed that absenteeism rates during the 2016 drought were high in Majuro (up nearly 10%) reaching 20.1%; in Lib the rate increased by 3.6% reaching 10.6%; in Ailinglaplap the rate rose by 3% reaching 6.3%. MOE data also revealed that the effects of the 2016 drought were more concentrated in elementary schools "perhaps due to the higher vulnerability of small children to the lack of water, and/or to the higher concern of parents in this regard" (PDNA Draft Report). The results of ACWA student consultations revealed that their schools have a serious water security problem that has significant impacts on attendance, performance and over student well-being;*
5. *Poor hygiene and sanitation during droughts which has negative health impacts caused by lack of water for bathing and cleaning, non-functioning toilets leading to increased open defecation and reduction in critical public services – primarily schools. Issues related to menstruation hygiene management were also raised by women during community consultations and by government and NGO officials;*
6. *Damage to social cohesion, resulting from community and household level disputes over access to and use of limited water supply during drought conditions. There are examples of families fighting over water and villages divided over land use rights; almost 30% of community stakeholders consulted reported conflict at community or household level over water issues;*
7. *Exclusion of women and other vulnerable groups from planning and decision-making processes at community, island and national level. During the GESI ACWA community*

consultation process all respondents stated that women are not involved in decision-making on water management matters at community level.

Based on the results of this gender analysis, it is clear that improving water quality and supply at both community and household level will create more equitable access to water resources for vulnerable groups including women, children, the elderly and those with disabilities, and will improve health and education outcomes, enhance livelihoods, and reduce household and community level conflict caused by water shortages.

This outcome will be achieved through investment in new and upgraded climate-proof water infrastructure and through implementation of a range of mainstreamed and targeted water resilience interventions aimed at ensuring that all members of target communities have the knowledge and ability to use water resources wisely and have real opportunities to be involved in training, planning and decision-making processes at all levels. Further, national policy level interventions and capacity building support provided by the project will ensure compliance with international water security and access standards and assist in achieving national and international goals and targets regarding gender equity and social inclusion.

Gender and Social Inclusion Action Plan and Budget

The following GESI Action Plan identifies numerous interventions to ensure gender responsive and transformative results through a range of mainstreaming and targeted strategies. Mainstreaming will ensure that women and youth, who are key players in natural resource and water management in the outer atolls and islands of RMI, are fully involved in community level design, implementation and monitoring processes. The "gender transformative" approach" refers to changes that can occur for women as a result of improved water supply by reducing their work burden; reducing conflict at household and community level and by enabling women to more actively participate in a community decision-making process not currently available to them. By ensuring women are included in CWCs they will have a formal, public role in water management which, over time, could lead to women's increased engagement in broader political processes at community and/or island level.

This Action Plan provides suggested entry points for gender-responsive actions to be taken during community-level project design and implementation and throughout monitoring and evaluation as outlined below. This includes the use of specific GESI indicators and targets to measure and track progress on these actions at activity level. Suggested indicators will need to be reviewed and incorporated in the detailed M&E plan to be developed during project commencement to ensure GESI data is routinely collected and analyzed throughout project implementation. In this regard, the ongoing identification of lessons learned and best practices in GESI should be included in six month and annual project update reports

To ensure adequate attention to GESI factors and outcomes, a Gender and Youth Specialist will be responsible for the implementing the action plan and have been provisioned for in the project budget This specialists will take the lead but it will be the responsibility of the entire project team and key stakeholder groups to ensure GESI results are achieved.

Project Design and Implementation

Detailed community level project design and implementation will take into consideration the following GESI implications:

1. Ensure the initial Water Resource Survey to be conducted in all targeted rural communities at project inception captures the views of women, men and youth. This will ensure that the type and location of new and upgraded water infrastructure will meet the needs of all community members and will also enhance buy-in and ownership for the project from the community as a whole.

2. Ensure women, men and youth are equitably represented and actively involved in all Community-based Water Committees. This will ensure that the needs and perspectives of all members of the community are addressed and will also assist in building leadership skills and empowering vulnerable groups. In order to garner genuine community support for gender balance on Water Committee, it is essential that both men and women receive gender sensitization training. Men need to understand that because women are generally the primary users of water at household and community level, their perspectives are critical to sustainable water planning and management.

3. Train women and youth from targeted communities in O&M and construction skills of household and rainwater harvesting systems, groundwater wells etc. This will enable women and young people living in rural areas who have limited employment opportunities to be actively engaged in designing, constructing, operating, maintaining and monitoring community water security investments which will serve to build sustainability and increase employability. It is important that the project strives for equitable participation of young men and women in training programs through establishment of an agreed gendered quota system.

4. Ensure new Standard Operating Procedures for household and community water security measures are gender and age sensitive by including GESI indicators in new SOPs.

5. Work with the Environmental Protection Authority (EPA) to improve water testing capabilities at community level and ensure that women and youth are involved in this process. This action is

needed to address community concerns related in inadequate monitoring of water quality in rural communities which leads to health issues (i.e., conjunctivitis, diarrhea, dehydration and increased communicable diseases) especially in children and the elderly.

6. Ensure that drought warnings and other relevant weather information is conveyed in accessible formats to all community members so that everyone has access to information required for improved readiness. This could include use of the public radio broadcasting, mass SMS text messaging, relaying information through local governments, traditional leaders, churches, health centers, schools and WUTMI Chapters.

7. Undertake a review of the RMI National Water and Sanitation Policy and Action Plan from a GESI perspective to ensure the full inclusion of vulnerable people in all relevant policy areas and strategies including social marketing campaigns and improved water and sanitation facilities in public locations. While this Policy has a strong gender equity and social inclusive perspective, it could be strengthened through the inclusive of specific targets related to the participation of women and other vulnerable groups in water and sanitation governance forums. Involving the Ministry of International Affairs and WUTMI in this review process would build capacity and lay a firm foundation for inter-agency collaboration.

8. Facilitate Inter-island knowledge exchange visits with women and youth sharing experience and best practice on climate change risk reduction on water resources. Create opportunities for learning exchanges facilitate inter-island competitive tournaments on best practices in climate change risk reduction on water resources, including water security and conservation of water resources. Trainings will serve to increase coping capacities, and reduce hardship faced by communities in times of disaster and water scarcity. This activity could be undertaken in partnership with the Marshall Islands Red Cross and existing women and youth networks (i.e., WUTMI and the National Youth Congress).

9. Provide certification programme for women and youth focused on climate change adaptation and disaster risk reduction. Women and youth's expertise in water demand management will be developed through a Climate Change and Disaster Risk Reduction certification programme part of a non-formal course of study at the University of the South Pacific. Women and youth engaged in learning exchange visits will also gather practical management skills, such as project management, written and oral presentation, reporting, monitoring and evaluation of project, conflict management, etc.

10. Ensure equitable participation of women and men in the upcoming Certificate Course for Water to be developed and implemented by the College of the Marshall Islands to promote employability of both women and men and ensure gender parity in the next generation of water leaders and experts in the RMI. It is important that curriculum materials developed for this course are GESI inclusive and that scholarships funded by the Project are awarded to equal numbers of women and men.

11. Build the capacity of the Ministry of Internal Affairs and all RMI state agencies responsible for water planning and management to assess climate change impacts on vulnerable groups of people, identify appropriate solutions and monitor impacts. This could be achieved through the provision of technical assistance, training, twinning arrangements and staff exchanges.

12. Ensure equitable representation and participation of women, men and youth in Annual National Water Forums and that the topics discussed are inclusive of the perspectives of vulnerable groups. To reinforce the importance of a gender and social sensitive approach to water resilience, it is recommended that this topic be addressed at the initial National Water Forum.

13. Ensure all information, education and communication materials developed by the Project are inclusive of the water security needs and rights of women, men and youth and are widely disseminated in user-friendly formats. This work will need to be undertaken in collaboration with specialist agencies to ensure that complex and often gender-sensitive concepts, issues, and solutions related to resilient water resource management will be understood by diverse actors. It will be important to draw on good practice examples regionally and globally for participatory

planning, reflective practice, and community engagement including use of popular theater, music, dance, story-telling, audio-visual productions, info-graphics etc. This work needs to build upon and be coordinated with the Reimaanlok process (RMI's community-led conservation process for marine and natural resource management).

14. Develop, implement and enforce a Code of Conduct for all project staff which includes a zero tolerance for discriminatory practices and violence of any kind.

Monitoring and Evaluation

Through onset analysis, data has been collated to establish a baseline which will be monitored throughout implementation. To ensure gender equality and climate resilience, it is important to combine high-quality geospatial data and studies with a participative community approach. This analysis has identified the differences between men, women and at-risk populations with respect to their water use needs, access requirements and decision-making inputs. In order to monitor and evaluate gender equity and social inclusion, relevant quantitative and qualitative outcomes are provided below. Table 23 shows GESI indicators and targets alongside overall project level measures and targets for ease of reference.

Quantitative outcomes:

- At least 49% of female-headed households will be beneficiaries;
- 50% of beneficiaries engaged in information dissemination activities and installation activities will be women and youth under the age of 25 (50% of youth will be girls);
- Improvements in health and well-being for men, women and youth through provision of safe and clean water, and measured by the number of RWH systems, and water structures installed per households;
- Improved learning and employment opportunities through formal and informal training programmes and learning opportunities with the University of the South Pacific for women and youth, measured by the number of women and the number of male/female youth in leadership roles in water pricing, regulation and access dialogue;

Qualitative outcomes:

- Opportunities to generate additional income. Women and youth are more likely to respond to incentives that address their family's basic needs, such as better health and nutrition, as a result of water security measures and the provision of 20 LPCD of potable water;
- Time-saving for women as a result of lower hours in labour required for water management practices prior to the implementation of the project;
- Contribution to improved self-esteem and empowerment of women and youth in the community as a result of training and leadership opportunities;
- Expanded involvement in public and project decision-making, and enhanced knowledge on climate change and efficient water practices as a result of formal and informal education programmes for women;
- Support for training and educational activities for women and youth provided by the University of the South Pacific and related to climate change and water demand management for reduced demand of rainwater and increased involvement of women and youth to participate with confidence, and take leadership positions in community meetings, competitive tournaments on efficient water practices;
- Effectiveness of awareness raising on climate change adaptation and its adverse impacts on the water, and agriculture sector in outer atolls and islands of RMI.

Table 23: Project and GESI Targets and Indicators

Objectives	Activities	GESI Targets and Indicators	Project Level Measures and Targets	Partner Institutions	Timeline	Budget (US$)
Output 1: Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI						
1.1. Improve existing rainwater harvesting systems for community buildings and households in outer islands and atolls during increasing frequency and periods of drought.	**1.1.1.** Improve existing rainwater harvesting systems for community buildings and households in the outer atolls and islands. **1.1.2** Improve existing rainwater harvesting systems for community buildings (CB) and increase storage capacity in the outer atolls and islands.	**Baseline: 0** **Target 1.1.1 (a)** At least 49% of female and single headed households have improved access to rainwater in target communities **Indicator: 1.1.1 (a):** Number of women, men and youth (male and female) and female headed households with improved access to potable water resources verified through project baseline, mid-term and end term surveys; annual monitoring reports **Target 1.1.1 (b):** At least 50% of beneficiaries engaged in installation activities are women and youth:50% of youth are girls **Indicator 1.1.1 (b):** Number of beneficiaries engaged in installation activities by gender & age **Target 1.1.1 (c):** 100% of community buildings with upgraded rainwater harvesting and storage are equally accessible to men, women, children, PWD and the elderly **Indicator 1.1.1 (c):** All community members equitably accessing and benefiting from upgraded CB water systems	**Measure: 1.1:** Number of households and community buildings with upgraded existing rooftop rainwater harvesting systems. **Target 1.1:** Upgrading of RWH for 2,529 households and 158 community buildings (target 49% female headed households)	OCS NDMO OEPPC Red Cross Youth groups WUTMI	Year 2 to the end of the project.	24,167
1.2. Provide additional rainwater harvesting systems and increase of storage capacity for	**1.2.1.** Build new roof catchment systems **1.2.2** Build new storage tanks	**Baseline: 0** **Target 1.2.1 (a)** At least 49% of female and single headed households have improved access to rainwater in target communities **Indicator: 1.2.1 (a):** Number of women, men and youth (male and female) and female headed households with improved access to potable water resources verified	**Measure 1.2:** Number of community buildings with improved efficiency of rainwater harvesting systems and increased storage capacity **Target 1.2:** 121 new community roof/storage systems installed	OCS NDMO OEPPC Red Cross Youth groups WUTMI	Year 2 to the end of the project.	16,313

communities in outer islands and atolls for usage during increasing frequency and periods of drought.		through project baseline, mid-term and end term surveys; annual monitoring reports **Target 1.2.1 (b):** At least 50% of beneficiaries engaged in installation activities are women and youth:50% of youth are girls **Indicator 1.2.1 (b):** Number of beneficiaries engaged in installation activities by gender & age				
Objectives	**Activities**	**GESI Targets and Indicators**	**Project Level Measures and Targets**	**Partner Institutions**	**Timeline**	**Budget (US$)**
Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall.						
2.1: Protect groundwater wells from more frequent storm surges and contamination	**2.1.1.** Provide community water solutions for water vulnerable populations	**Baseline: 0** **Target 2.1.1 (a):** At least 50% of female and single headed households targeted for groundwater protection in target communities **Indicator 2.1.1 (a):** Number of women, men, children/youth, elderly and PWD, inclusive of single headed households with increased access to good quality groundwater and improved aquifer infrastructure **Indicator 2.2.1 (b):** 100% of women and youth have improved understanding of groundwater protection ad management	**Measure 2.1:** Number of wells protected from storm surge and surface derived contamination. **Target 2.1:** 100% (2586) target households and community groundwater wells will be protected from storm surges and contamination in 77 target rural communities	Red Cross Women's groups Youth groups WUTMI	Year 1 to the end of the project.	97,336
2:2: Enhance women and youth's leadership through best practices and community awareness programmes on efficient usage (demand	**2.2.1** Facilitate inter-island knowledge exchange visits with women and youth, sharing experience and practice on water conservation **2.2.2** Certification program for	**Baseline: 0** **Target 2.2.1 (a):** 100 percent women and youth (50% of youth are girls) participate in knowledge exchange visits **Indicator 2.2.1 (a)** Number of women and youth (male and female) who complete knowledge exchange visits and results of gender analysis of participant evaluations **Target 2.2.1 (b):** 100 percent women and youth (50% of youth are girls) undertake certificate program on CCA and/or DRR	**Measure 2.2:** extent of adoption of best practices. **Target 2.2:** 100% of training participants have adopt the best practices (disaggregated by gender)	Red Cross Women's groups Youth groups WUTMI University of the South Pacific	Year 1 to the end of the project.	1,448,881

management) of rainwater	women & youth focused on climate change adaptation & DRR	**Indicator 2.2.1 (b)** Number of women and youth (by gender) who complete CCA certificate program and results of gender analysis of participant evaluations **Target 2.2.1 (c):** At least 50% of women and youth who participated in knowledge exchange visits and CCA certification become involved in water conservation efforts including water pricing, regulation and access dialogue in their communities/groups. **Indicator 2.2.2 (c):** Number of women and youth (by gender) who become engaged in CCA/DRM activities in their communities/groups				
Objectives	**Activities**	**GESI Targets and Indicators**	**Project Level Measures and Targets**	**Partner Institutions**	**Timeline**	**Allocated Budget**
Output 3: Climate change induced drought preparedness and response measures implemented in outer atolls and islands						
3.1 Develop national-level contingency plans and Standard Operating Procedures (SOPs) for climate change induced drought response	**3.1.1.** Conduct training programs for drought risk management and contingency planning at institutional level **3.1.2.** Implement SOPs for drought preparedness and response	**Baseline: 0** **Target: 3.1.1 (a):** 50% of participants involved in drought risk management and contingency training at institutional level are women and youth **Indicator 3.1.1 (b):** Number of women and youth actively involved in development and implementation of SOPs and results of gender analysis of participant evaluations **Target: 3.1.1 (b):** GESI considerations fully mainstreamed in national level contingency plans and SOPs **Indicator 3.1.2 (a):** New SOPs include gender targets and indicators	**Measure 3.1:** Effectiveness of training for drought response as indicated by adoption of contingency plans and SOPs. **Target 3.1:** 100% of CWCs, having been trained, have adopted the contingency plans and SOPs	CMI OCS OEPPC NDMO	Year 1 to the end of the project.	101,601
3.2 Develop and implement community-level drought contingency planning in	**3.2.1** Training for community-based water committees and local government representatives	**Baseline: 0** **Target: 3.2.1 (a):** Community Water Committees (CWCs) are comprised of 50% women and youth; youth are 50% girls	**Measure 3.2:** Number of developed and implemented community-level drought contingency planning in outer islands and atolls (includes formation of Community Water Committees)	CMI OCS OEPPC NDMO	Year 1 to the end of the project.	28,178

outer islands and atolls	**3.2.2** Training community members in operation and maintenance of rainwater harvesting systems	**Indicator 3.2.1 (a):** Number of women and youth who regularly attend and participate on CWCs; results of focus group discussions with CWC stakeholder groups **Target: 3.2.1 (b):** 50% of participants involved in community level training are women and youth; youth are 50% girls **Indicator 3.2.1 (b) :** Number of women and youth who attend community based training program and results of gender analysis of participant evaluations **Target: 3.2.1 (c):** 100% of community-level drought contingency plans are GESI sensitive **Indicator 3.2.1 (c) :** Number of community-level contingency plans that are responsive to the needs of women, children and other vulnerable groups during droughts	**Target 3.2:** 77 community-based water committees (CWCs) with enhanced capacities to develop, implement, operate, maintain and monitor drought SOPs			

ANNEX 1

Summary of Women and Men's Consultations

Water Supply: Household Level

- Table 4 shows that 95% of households in the areas consulted reported that they get their water from household rainwater tanks during normal weather conditions. During times of drought, only 44% said water they get water from household rainwater tanks.

Table 4: Sources of Household Water Supply

Q 1: Where does the community get their water from?

Water Supply During Normal Weather Conditions			
	Well	**Rain Tanks**	**Total**
Sub Total	**2**	**42**	
Total		**44**	
%	**5%**	**95%**	**100%**
Water Supply During Droughts			
	Well	**Rain Tanks**	**RO only**
Sub Total	**4**	**20**	**2**
Total			
%	**9%**	**44%**	**4%**

- As shown in Table 13 (pg 43) the primary concern of all stakeholders consulted is the lack of rainwater catchment at household and community level – including schools and health care centres. The vast majority of people consulted indicated they are highly dependent on rain water harvesting and supplies are inadequate prolonged during dry periods.

Figure 5: Household Water Supply During Normal Weather Conditions

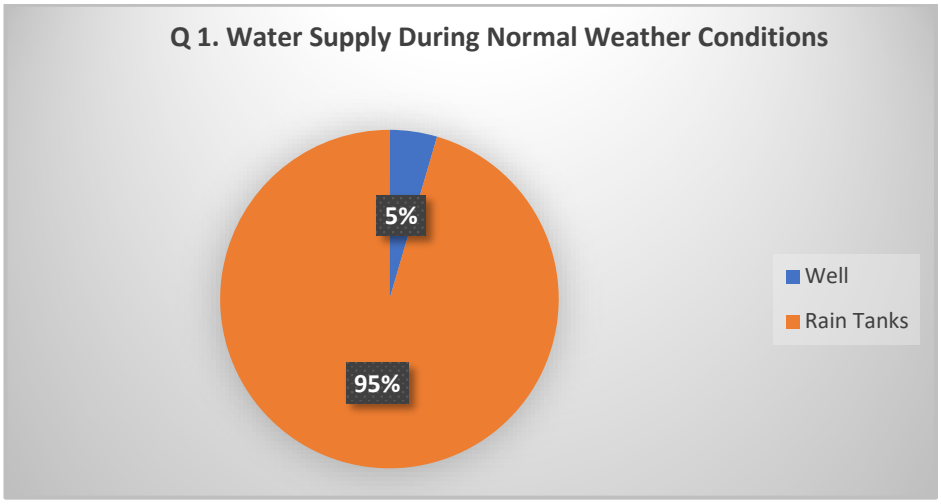
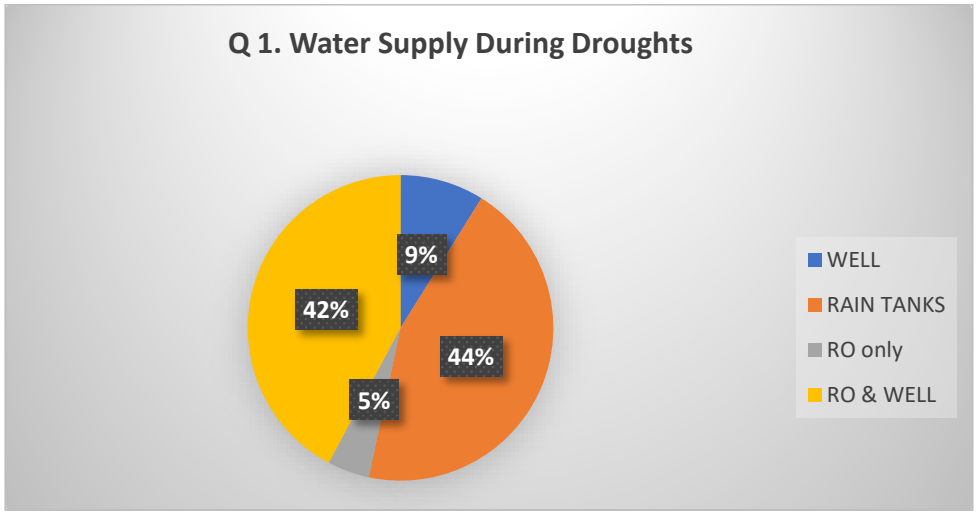


Figure 6: Household Water Supply During Periods of Drought

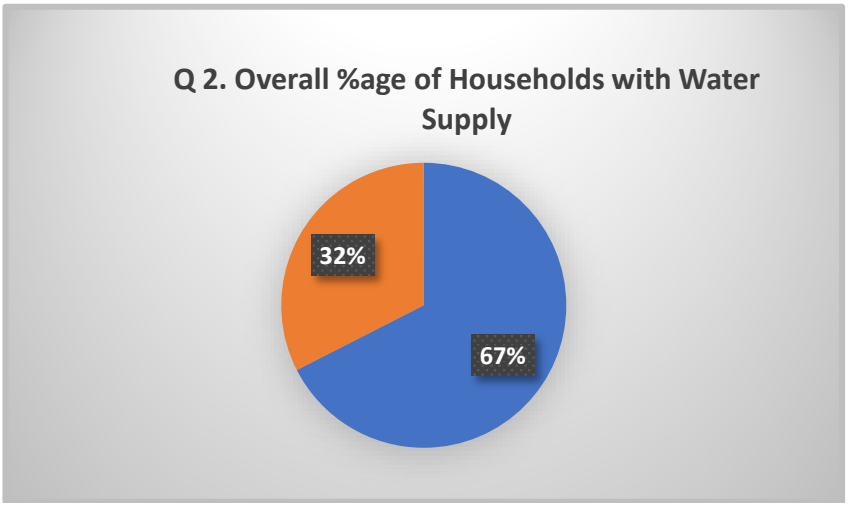


- In response to the question regarding household water supply, respondents estimated that 67% of households in their community have water supply while 32% do not have household access.

Table 5: Household Access to Water Supply

Q 2: Does everyone in the community have a household water supply?		
Overall %age of Households with Water Supply		
With	Without	Total
67%	32%	100%

Figure 7: Estimated %age of Households with Water Supply



Water Supply: Community Level

- Table 6 shows public water sources available in the communities consulted.

Table 6: Type of Community Water Sources

Q 16: What public water sources are available in the community (excluding household level)?				
	Well	**Tank**	**RO units**	**Total**
Sub Total	2	24	16	
Total				**42**
%	**5%**	**57%**	**38%**	

- The majority of public water supplies are located at community centres and churches, with fewer numbers at health care centres, airports and schools.
- Of significant concern, about 40% of public water sources were reported to be non-functioning as shown in Table 7.

Table 7: Condition of Public Water Sources

Q 16a: Condition and Quality of water from this source?				
	Working	**Not Working**	**Polluted**	**Total**
Sub Total	24	17	1	
Total				42
%	**57%**	**40%**	**2%**	**100%**

- When asked if there is a current water shortage in the community, 68% of respondents believed there is.
- When asked where additional public water supplies should be located, respondents stressed the need to identify accessible locations, close to housing and schools, that would be accessible to all members of the community, regarding of who owns the land. While locating

water tanks at churches was also suggested by numerous respondents, concern was also raised that people who do not attend that church would have no or restricted access.

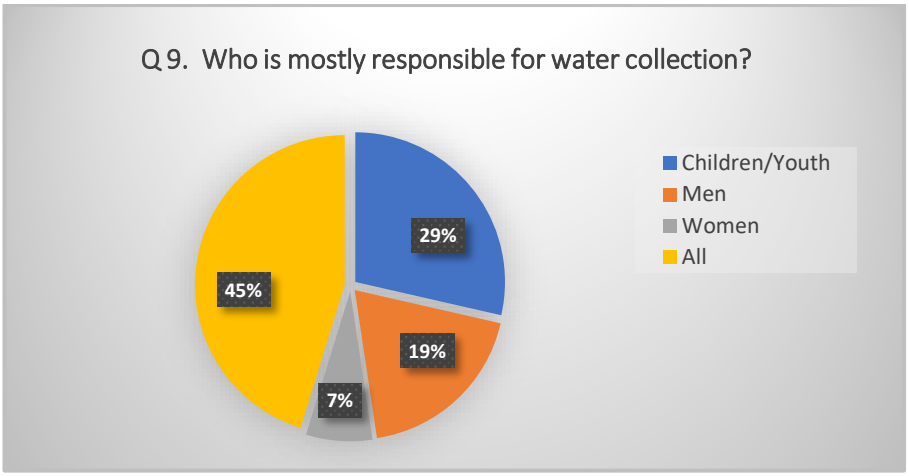
Table 8: Respondent Perspective on Current Water Shortage

Q 4: Is there a currently a water shortage in the community?			
	Yes	**No**	**TOTAL**
%	**68%**	**32%**	**100%**

Water collection

- Community consultations revealed that the responsibility for water collection is widely dispersed within families as shown in Figure 8.

Figure 8: Responsibility for Water Collection in Families Consulted



Safety

- Almost 60% of respondents, including men, women and youth raised concerns about safety en route or at water sources. These issues included stealing, fighting and harassment. In response to the question about whether action had been taken to resolve security issues, about 30% indicated action had been taken place but they did not indicate what this involved. About 84% of respondents indicated that safety issues have *not* been resolved or made no comment in response to this question. Only 10% of men and 6.7% of women indicted that safety issues have been resolved.

Water quality

- In response to the question about whether people think their water is safe to drink, 56% of respondents indicated “no” or “sometimes”, while 44% of respondents believe their water is safe to drink.

Table 9: Respondent Views on Safety of Drinking Water

Q. 11: Do you think your water is safe to drink?			
	Yes	**No**	**Sometimes**
Sub Total	19	9	15
Total			
%	**44%**	**21%**	**35%**

- When asked whether people get sick from consuming the water, about 60% said "yes" - of these the majority are children. The most common illness attributed to poor water quality were stomach aches, eye problems, diarrhoea and skin disorders. While the majority of respondents said they usually seek medical treatment for these aliments, the reasons people don't seek treatment include transportation difficulties, "*goes against custom*", "*because we are ashamed*" and lack of medical facilities and supplies.

Water treatment

- ***Boiling:*** 46.5% of all respondents indicated that they never boil water from tanks before drinking while 46.5% said they sometimes do. The remaining 7% said they always boil water from rain tanks prior to consumption (primarily respondents from Rongrong, Mejatto and Ronglap). About 71% of all respondents indicated they never boil water used for food preparation; 14.6% they "sometimes" do, with about the same number of respondents indicating they always boil tank water used to prepare foods (primarily people living in Rongrong and Lib). About 56% of all respondents indicated they never boil groundwater; 18.6% said they "sometimes" do, while 25.6% said they "always" boil groundwater for drinking.

- ***Filtering:*** In response to questions about filtering water for drinking purposes, about 51% of all respondents indicated they never filter water from rain tanks; about 30% said "sometimes" and.21% said they always filter water from rain water tanks prior to consumption (primarily respondents from Maloelap, Tarawa, Airok, Wollot, Jeng, Mejit and Likiep.). With regard to filtering rain water for food preparation, about 62% of respondents said "never"; 21.4% said "sometimes" and 16.7% said "always" (mainly people from Maloelap Airok, Jeng, Mejit, Likiep, Ebadon. Lib, Jabot). With regard to groundwater, about 79% of all respondents indicated they never filter ground water for drinking; while 21% said they "sometimes" do. There was relatively the same response to the question on filtering ground water for food preparation purposes.

- ***Cleaning Agents:*** In response to questions about whether people add any type of disinfectant to rain tank water prior to drinking, about 44% said "never", 40% said "sometimes" and 26% said "always" (primarily respondents in Lae Ailuk, Likiep p, Ujae Uae, Mejatto Kwajalein/Ronglap). In terms of treatment of groundwater used for drinking, about 72% indicated they never add disinfectant; 16% said sometimes and 12% said always (respondents from Lae, Aur, Mejit, Kwajalein Ebadon). With respect to adding cleaning agents to water used for food preparation, about 58 % of all respondents indicated they never add disinfectant to tanks water; 23% said "sometimes" and 18.6% said 'always' (primarily respondents from Lae, Ailuk, Likiep, Ujae Uae, Mejatto Kwajalein/Ronglap). About 77% of all respondents indicated they never add disinfectant to groundwater for food preparation,14% said sometimes and 9.3% said "always" (primarily respondents from Lae , Mejit, Ebadon).

Water management

- As shown in Table 10, household level decision-making on water use seems to be largely shared between women and men (76.2%). However, in cases where one gender was specified as the primary decision-maker, men play this role about 4% more often than women. At the community level, all respondents indicated that men are the sole decision-makers. In some cases, women's focus groups indicated that they were displeased with this arrangement.

Table 10: Water Management Decision-Making by Gender at Household and Community Level

Gender	Who makes decisions re water use at household level?	Who makes decisions re water use at village level?
Men	**12.50%**	**100%**
Women	**8.30%**	**0%**
Both	**76.20%**	**0%**

- These finding have significant implications for the design of the project. In order to ensure that water governance and management arrangements at community level are gender inclusive, specific strategies will need to be developed and implemented.

Sanitation and Hygiene

- As shown in Table 11, community stakeholders reported a number of sanitation impacts when water supply is low.

Table 11: Impacts of droughts on sanitation and hygiene

Impacts on sanitation during water shortages	% of Respondents
Less water to wash	14.3
Sanitary issues	42.9
Never wash	14.3
Toilets don't work	14.3
Schools closed due to lack of water	14.3

- Although a question was asked regarding the number of households with/without toilet facilities, it is not possible to provide an accurate count as people seemed reluctant to answer this question, gave vague answers or provided %age responses without indicating the number of households included in calculations.

  However, in all locations visited, respondents indicated that people often use the bush or beach for toileting purposes. When asked if this practice creates any difficulties for the community, over 72% said "yes". The primary issues identified were pollution, increased flies, unsanitary conditions and spread of disease.

- When asked where additional toilets would best be located, 65% of respondents indicated churches and schools.

Menstruation Hygiene Management (MHM)

- Although all female respondents were asked questions regarding the impact of water shortages and availability of sanitation facilities on menstruation, very few responses were received. This is most likely due to cultural taboos and discomfort in discussing this issue in the public domain – perhaps on the part of both the researchers and the respondents.

- Of the responses received to questions regarding MHM issues, 11 focus groups indicated that water issues have a negative impact on school attendance and performance during

menstruation; 7 groups stated that health problems arise due to inadequately water during menses; 6 groups stated there are cultural restrictions related to water use by women and girls during menstruation such as not being able to prepare food, be around certain family members or access water from wells and sometimes other locations.

- Some male focus groups also discussed MHM issues, and confirmed the cultural restrictions facing women and girls during their menses. For example, they are "n*ot allowed to get water from the well"* and so "*can't keep themselves clean*". One man commented that "*no clean, no go around"*.

Livelihoods

- The primary source of income reported by all communities surveyed was copra, with handicraft sales being the secondary source of cash. In response to the question regarding total household income (from all sources) in an average 3-month non-drought period, 65% of households were said to earn between $200-$400; about 16% were said to earn between $400-600 and the remainder earn anywhere from less than $200 to over $1500. In response to the question regarding total household income (from all sources) in an average 3-month drought period, incomes were said to drop by at least 50% across all areas. There were no significant differences in the figures provided by women and men or by location to either of these questions.

Education

- As shown in Table 12, over 91% of community stakeholders consulted indicated that there are negative impacts on education when water supply is low. The primary consequence reported were reduced attendance caused by sickness and school closures (about 82%) followed by poor performance (about 34%).

Table 12: Impacts of drought on education

Are there any impacts on school(s) when water supply is low?	% of Respondents
Attendance	82.2%
Low grades	34.1

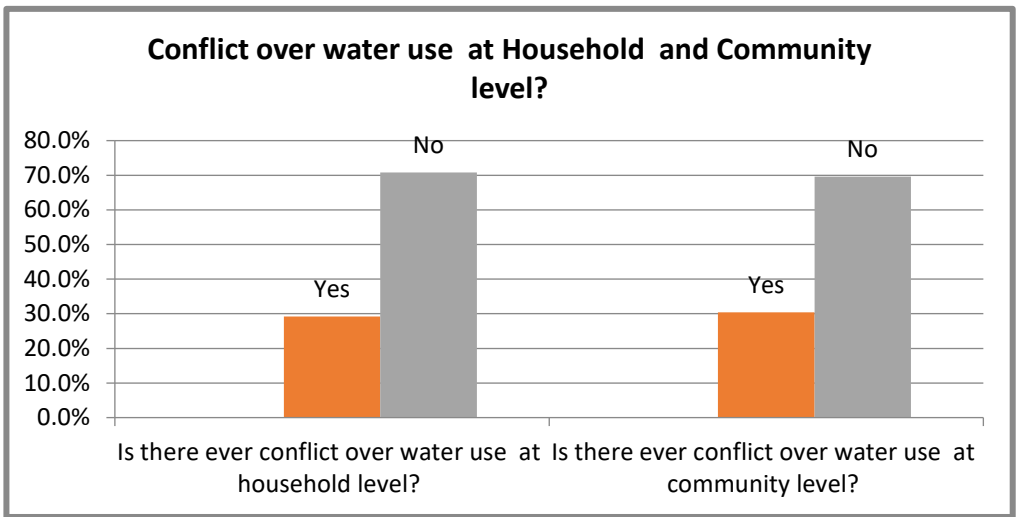
Migration

- In all communities surveyed, a total of 164 families were reported to have relocated over the past five years. The majority of these families moved to the USA, the remainder were have relocated to Majuro or Ebeye. Over 80% if these households were said to have relocated to access better education and employment opportunities; about 20% moved due for medical reasons.

Conflict

- Figure 9 shows responses in relation to the question on the presence of conflict within communities and households over water related issues (about 30% said "yes").

Figure 9: Conflict over Water Issues



- Respondents indicated that water shortages can cause significant tensions within families and communities that have long-term impacts on relationships. People said there are fights over who should have access to public water supplies and not sharing equally. Respondents also noted that people are reluctant to ask other households for water because they feel ashamed.

Preferred locations of new public water supplies

- When asked where any new community water supplies should be located, the number one response was churches (60.7%); followed by community centers (13.4%), "central" community location (13.4%) and schools (8.6%). Most comments related to this question revolved around the need to ensure public water sources can be easily accessed by everyone in the community.

Student Consultations

The community consultation process also included school-based consultations involving a total of 200 students (132 female and 68 male) attending 18 elementary schools and 1 high school[22] in targeted areas. The purpose of these consultations was to solicit the views of students on the adequacy of water and sanitation facilities at their schools and the impacts this has on their education (attendance, performance and attitude) and overall wellbeing

The results of these consultations are intended to augment the findings of the concurrent GIZ *Climate Change Resilience Project* design research on the adequacy of sanitation systems in outer island boarding schools (see Section 5.1).These consultations, carried out by the WUTMI and MIOF field researchers engaged as part of the project design process, were conducted using a focus group methodology centered around the same survey instrument used by the Climate Change Resilience Project team to ensure consistency of data collected.

The following tables highlight the key findings from student consultations.

[22] Including Rongrong High School and the Elementary schools located in Aur, Tobal Aur, Airok, Tarawa, Wolot, Jeng, Kaben, Mejit, Ailuk, Utrik, Likiep, Ebadon, Mejatto, Ujae, Lae, Lib and Majken.

Table 14: Availability of Water at Schools Consulted

Is water available at your school?			
	No	Yes	Total
Sub Total	12	6	
Total		18	
%	67%	33%	100%

Table 15: Adequacy of Water Supply at Schools Consulted

When the water source is working does it provides enough water for drinking, hand-washing & food preparation?			
	No	Yes	Total
Sub Total	15	3	
Total		18	
%	83%	17%	100%

Table 16: Student Views on Water Quality at their School

Do you think that water at your school is safe to drink?			
	No	Yes	Total
Sub Total	8	10	
Total		18	
%	44%	56%	100%

Table 17: Condition of toilets at Schools Consulted

Are most (75%) of the toilets at your school working?			
	No	Yes	Total
Sub Total	18	2	
Total		20	
%	90%	10%	100%

Table 18: Separate Toilet Facilities for Boys and Girls at Schools Consulted

Are there separate toilets for boys and girls at your school?			
	No	Yes	Total
Sub Total	14	5	
Total		19	
%	74%	26%	100%

Table 19: Accessibility of School Toilets for Students with Physical Disabilities

Are there separate and accessible toilets for students with physical disabilities at your school?			
	No	Yes	Total
Sub Total	18	0	
Total		18	

%	100%	0%	100%

Table 20: Private Facilities for Girls during Menstruation at Schools Consulted

Are there private facilities available for girls during their menstruation?			
	No	Yes	Total
Sub Total	18	0	
Total	18	0	
%	100%	0%	100%

Table 21: Condition and Availability of Hand-Washing Facilities at Schools Consulted

Do most (75%) hand-washing facilities work at your school?			
	No	Yes	Total
Sub Total	18	1	
Total		19	
%	95%	5%	100%

Table 22: Recent Learning about Sanitation and Hygiene at School

Students have heard about WASH topics in class in the past month			
	No	Yes	Total
Sub Total	16	2	
Total		18	
%	89%	11%	100%

ANNEX 2

Community Consultation Survey Form

Focus Group Survey for use with Women and Men's Groups

Name of Community:_____ **Island:** _____

Total population of Community: _____ **Contact Person:** _____

 # People Consulted: Female: ____ (under 25) ___ (Over 25__) **Men:** ___ (Under 25) ___ (Over 25__)

Name of Surveyor: _____ **Date:** _____

EXPLAIN PURPOSE OF PROJECT AND CONSULTATION: SEE TALKING POINTS

A. Water Quantity/Supply

Possible GESI Impacts:
- Inequity - some people have access to water, others do not;
- Conflicts within families/communities or between family's communities over water;
- Food insecurity (i.e., reduced yield from crops, fisheries and/or livestock);
- Reduced livelihoods (i.e., reduced income from market sales; handicrafts, job loss; failed enterprises);
- People leave the community due to water problems.

1. **Where does the community get their water from?**

Purpose	During normal weather patterns	During droughts
Drinking		
Cooking		
Bathing		
Crops		
Livestock		

2. **Does everyone in the community have a household water supply? Yes** ____ **No** ____
   If NO, how many households do not have working rain water tanks?

_____
_____
_____

3. **Is water for sale in the community or nearby? Yes** _____ **No** _____
   If YES, approx what % of community purchases regularly?

_____

Approx amount purchased per family monthly? _____Cost per unit _____

4. **Is there currently a water shortage in the community? Yes** ____ **No** _____
   If YES, when did the shortage start?

_____

5. How many families have moved out of the community over past 5 years? _____
Where did they go?

_____
_____
_____

6. What are the main reasons why people move out of the community?

_____
_____
_____

7. Has anyone moved out of the community due to water problems? Yes ____ No _____

8. What are the main sources of income for the community?

Source	Average amount earned per household in 3 month period during normal weather conditions	Average amount earned per household in 3 month period during drought periods
Copra		
Food Crops		
Handicrafts		
Livestock		
Tourism		
Other (specify)		

B. Water Collection

Possible GESI Impacts:
➢ Increased time required for water collection can effect workloads/other responsibilities – i.e., children miss school, parents spend less time on child/home care, subsistence and livelihood activities; ➢ Changes in water source can lead to safety or security issues ➢ Changes in water source can create access issues for some – i.e., elderly, PWDs, pregnant women.

9. Who is mostly responsible for water collection in the community/family?
Women ____**Men** ____**Youth** (male) ____ (female) ___**Children** (boys) ___ (girls) ____

10. Are there any concerns about safety or security en route or at water source? Yes___
No____ **If YES**, what concerns?

_____
_____

If YES, has action been taken to address concerns? Yes ____ No ____
Are safety issues resolved now? Yes ____ No ____

How were these issues resolved?

_____
_____
_____
_____

C. Water Quality

Possible GESI Impacts
- Increased health problems (i.e., dehydration, diarrhea, eye problems, skin disorders, typhoid, and dinghy) for most vulnerable groups (i.e., young children, pregnant and lactating women, elderly, PWDs).

11. **Do you think your water is safe to drink?** Yes ____ No _____ Sometimes _____
If No or Sometimes: When and why is water not safe?

_____
_____

12. **Do people boil water from rain water tanks and ground water for the following purposes?**

Purpose	Rain Water			Ground Water		
	Always	Sometimes	Never	Always	Sometimes	Never
Drinking						
Food prep						

13. **Do people add a disinfectant from rain water tanks and ground water for the following purposes?**

Purpose	Rain Water			Ground Water		
	Always	Sometimes	Never	Always	Sometimes	Never
Drinking						
Food prep						

If YES, what is added to the water?

_____

14. **Do people filter water from rain water tanks and ground water for the following purposes?**

Purpose	Rain Water			Ground Water		
	Always	Sometimes	Never	Always	Sometimes	Never
Drinking						
Food prep						

15. **Do people get sick from drinking the water?** Yes ____ No ____ Sometimes _____

If YES, who gets sick most?_____ How often? _____
If YES, what kinds of illnesses? _____
If YES, do people usually seek medical treatment? Yes ____ No ____Sometimes _____
If NO, why not?
_____
_____

D. Water and Sanitation Infrastructure

Possible GESI impacts:
- Water supply is not easily accessible for some people (i.e., children, elderly, PWDs)
- Latrines are inaccessible for some people
- Latrines offer insufficient privacy and security
- Latrines do not provide water for hygiene (i.e. MHM)

16. What public water sources are available in the community (excluding household level)?

Type of Water Source (tanks, wells, ROs)	Location	Who has access to this source?	Who does not have access to this source and reasons why?	Condition and quality of water from this source*

** Working (W); Not working (NW); Clean (C); Polluted (P); Salty (S)*

17. If additional water supply sources were made available to the community for public use, where would these sources be best located? Why? Possible issues arising?

Where in Community	Reasons Why	Possible access or other issues?

18. About how many householders in the community do not have toilets in house?
_____
_____
_____

Where do these people go for toileting purposes?
_____
_____

Does this create any issues in the community?

_____
_____

19. How many public toilets are available in the community? _____

Location	Number and type of toilet	Source of water for flushing	Who has access to this toilet?	Who does not have access to this toilet and reasons why?	Working or (W) or Not in Working (NW)

20. If additional toilets were made available in the community for public use, where should these be located? Why?

Where in Community	Reasons Why	Possible access or other issues?

21. FOR WOMEN'S CONSULTATIONS ONLY

a. How do water shortages affect women and school girls during menstruation?

_____
_____
_____
_____
_____

b. Any impacts on school attendance or performance related to menstruation? Yes__ No __
If YES, explain impacts

_____
_____
_____

c. Any impacts on women and girl's health related to menstruation? Yes___No _____
If YES, explain impacts

_____
_____
_____
_____

d. Any impacts on women and girls due to lack of access toilets (home, school or community) during menstruation? Yes____ No _____

If YES, explain impacts

_____
_____
_____

e. Are there any cultural restrictions related to water for women/girls during menstruation? Yes____ No __ If YES, explain

_____

E. Water Management

Possible GESI impacts:

i. Island and community-level decision-making processes re water use/access exclude women and other vulnerable groups resulting in needs not considered/addressed;

ii. Island and community-level decision-making processes re maintenance exclude women and other vulnerable groups resulting in needs not considered/addressed;

iii. Island and community-level decision-making processes re new infrastructure exclude women and other vulnerable groups resulting in needs not considered/addressed.

22. Who makes decisions re water use at household level? Men__Women __ Both ___
at community level? Men ___Women ___Both ___

23. Is there ever conflict over water use at household level? Yes____ No ____
at community level? Yes ____ No ____

If YES, what are the arguments about? How do they get resolved? Are there long-lasting effects on relationships?

_____
_____
_____
_____

24. Are the women or men surveyed generally happy with the way decisions about water are made at community level? Yes ____ No ____

If NO, why not? _____
If NO, what could be done to make decision-making processes better for everyone?

_____
_____
_____

25. How is the community informed when a draught is expected?

_____
_____
_____

Is this warning system effective? Yes ____ No _____

If No, Reasons why not: _____

_____

If NO, what could be done to improve the effectiveness of early warning system?

_____
_____
_____

26. What does the community do when water levels are getting low? (restrictions, rationing)

_____
_____
_____

F. Community Services

Possible GESI impacts:
- Schools unable to provide proper education due to inadequate water supply/quality which negative affects attendance and performance of students and teachers;
- Health care centers unable to provide proper health services due to inadequate water supply/quality leads to patients not seeking treatment;
- Other community services, including businesses, unable to function properly leading to reduction in goods and services available and lost revenue

27. Are there any impacts on school(s) when water supply is low (attendance and performance)? Yes ____ No ____

If YES, what impacts (specify name of school, # of students affected in 2016 drought):

_____
_____
_____

28. Are there any impacts on the health care center(s) when water is low? Yes ___No ___

If **YES**, what impacts (specify name of heath care center and services affected in 2016 drought):

_____
_____
_____
_____

29. Are any other community/island services affected when water is low? Yes ___ No ___

If **YES**, specify what services were impacted in 2016 drought):

_____
_____
_____

G. Main Concerns and Proposed Solutions

30. What does the group think are the main WATER/WASH related problems in the community?

1. _____
2. _____
3. _____
4. _____
5. _____

31. What does the group think are best ways to improve WATER/WASH issues in the community?

1. _____
2. _____
3. _____
4. _____

32. Other comments

ANNEX 3
Student Consultation Survey Form

Management of WASH in Schools

Interviewer (s):		**Time:**	**Date:**
Survey Approach / Method	Group Interview / Focus Groups (Teachers , Students, PTA, Maintenance)	**1. Island / Atoll:**	
1.1 District		1.2 Name of LLG:	
1.3 Name of School		1.4 Name of Village:	
1.5 School Population (M/F in age groups)		**2.Level of Assessment:**	Preliminary Assessment
3. Evaluation Focus:	WASH		
4. Method used:	UNICEF Rapid Monitoring of WASH in School Bottlenecks		
5. Group make up: (take group photo)	Total Male:	Total Female:	School Children:

Table 1: *Water*

Questions / Observations	Yes	No	Notes
Water. A functional and child-friendly water point is available at or near the school that provides a sufficient quantity of water that is safe for drinking			
W1. An improved water source is available at or within 1500ft (500 meters) of the school			
W2. The water source is currently functioning and water is available at the school			
W3. Drinking water has been available to students at all times during the past week			
W4. When the water source is functional, it provides enough water for the needs of the school including drinking, handwashing & food preparation			
W5. There is evidence that water is safe for consumption			
W6. The drinking water facilities are accessible to young children and students with disabilities			

Notes:
W1. Based on Joint Monitoring Program definitions6, improved water sources include water piped to taps or public stands, protected wells and springs, boreholes, rainwater, and bottled water if there is another water source for washing, cooking and other needs.
W5. Examples of evidence include: the presence of covered filters with a safe mechanism for accessing water such as a tap, presence of chlorine residual (0.2- 0.5 mg/L free chlorine), or absence of faecal or thermotolerant coliforms in 100 mL.

Table 2: *Sanitation*

Questions / Observations	Yes	No	Notes
Sanitation. The number of improved and functional toilets and urinals meet national standards and are clean and child-friendly			
S1. The school has improved toilet facilities			
S2. At least 75% of toilets are functional			
S3. The number of functional toilets and urinals meet national standards			
S4. At least 75% of functioning toilets are clean			
S5. There are separate toilets for boys and girls			
S6. There are toilets accessible to students with physical disabilities			
S7. There are toilets available for younger children			
S8. Individual toilet compartments are lockable from the inside and secure			
S9. Private facilities are available for girls during menstruation			

Notes:
S1. Improved toilet facilities include traditional pit latrines, ventilated improved pit (VIP) latrines, flush and pour-flush toilets, and composting toilets
S2. "Functional" defined as useable with no major physical problems. The %age can be changed based on program goals.
S3. World Health Organization guidelines may be used in the absence of national standards: no more than 25 girls per toilet and 50 boys per toilet and urinal (every 50 cm of urinal wall = 1 urinal)7
S4. "Clean" defined as free of faeces on the seat / wall / floor, no large amounts of urine, dirt or litter, no strong bad smell, and no significant fly problem. The %age can be changed based on program goals.
S7. Toilets for younger children should have a smaller drop hole, squat plate or lower toilet, low door handle, and the compartment should not be so dark it frightens children
S9. Private washing facilities for cloth napkins or private disposal for disposable napkins

Table 3: *Hygiene*

Questions / Observations	Yes	No	Notes
Hygiene. Functional and child-friendly handwashing facilities and soap (or ash) are always available to students, and there is quality hygiene education at the school			
H1. The school has handwashing facilities			
H2. At least 75% of handwashing facilities are functioning with water currently available			
H3. The number of functioning handwashing facilities meets national standards			
H4. Sufficient soap (or ash) is currently available at a convenient location for student use			
H5. Soap and water have always been available to students in the past week			
H6. Handwashing facilities are accessible to children with physical disabilities			
H7. Handwashing facilities are accessible to younger children			
H8. Hygiene is taught at the school			
H9. There is a designated time period allotted to students to wash their hands before eating			
H10. Students have heard about WASH topics in class in the past month			
H11. Posters or other hygiene promotion materials are seen in the school			
H12. At least one teacher has attended a training or workshop on hygiene education in the past year			

Notes:

H1. Handwashing facilities can be a faucet with running water, a container with tap, bucket with dipper and basin, or another similar mechanism.

H8. Mark yes if, hygiene education is provided through special lessons, part of life skills training, or part of the regular curriculum, and includes at least some instruction on handwashing with soap or ash