Funding Proposal

FP112: Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands

Marshall Islands | United Nations Development Programme (UNDP) | B.23/10

23 July 2019
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

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Section B  FINANCING / COST INFORMATION
Section C  DETAILED PROJECT / PROGRAMME DESCRIPTION
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Section F  APPRAISAL SUMMARY
Section G  RISK ASSESSMENT AND MANAGEMENT
Section H  RESULTS MONITORING AND REPORTING
Section I  ANNEXES

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

<table>
<thead>
<tr>
<th>A.1.1. Project / programme title</th>
<th>Addressing Climate Vulnerability in the Water Sector (ACWA) in the Marshall Islands</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1.2. Project or programme</td>
<td>Project</td>
</tr>
<tr>
<td>A.1.3. Country (ies) / region</td>
<td>Republic of Marshall Islands</td>
</tr>
<tr>
<td>A.1.4. National designated authority (ies)</td>
<td>Office of Environmental Planning and Policy Coordination</td>
</tr>
<tr>
<td>A.1.5. Accredited entity</td>
<td>United Nations Development Programme</td>
</tr>
<tr>
<td>A.1.5.a. Access modality</td>
<td>☐ Direct ☒ International</td>
</tr>
<tr>
<td></td>
<td>Beneficiary:</td>
</tr>
<tr>
<td></td>
<td>• Outer atoll and island communities (approx. 15,572 direct beneficiaries, including 7,630 women)</td>
</tr>
<tr>
<td></td>
<td>• Population of RMI (55,226) will benefit indirectly through capacity building and integration of water management into national governance framework.</td>
</tr>
<tr>
<td></td>
<td>• National and local government:</td>
</tr>
<tr>
<td></td>
<td>o Office of Chief Secretary</td>
</tr>
<tr>
<td></td>
<td>o Environment Protection Agency</td>
</tr>
<tr>
<td></td>
<td>o National Disaster Management Office</td>
</tr>
<tr>
<td></td>
<td>o Office of Environmental Planning and Policy Coordination</td>
</tr>
<tr>
<td></td>
<td>o Local governments (24 in total)</td>
</tr>
<tr>
<td></td>
<td>• NGOs/CBOs (WUTMI and others)</td>
</tr>
<tr>
<td>A.1.7. Project size category (Total investment, million USD)</td>
<td>☐ Micro (≤10) ☒ Small (10&lt;x≤50) ☐ Large (&gt;250)</td>
</tr>
<tr>
<td>A.1.8. Mitigation / adaptation focus</td>
<td>☐ Mitigation ☒ Adaptation ☐ Cross-cutting</td>
</tr>
<tr>
<td>A.1.9. Date of submission</td>
<td>22 Jun 2018 / 12 April 2019/ 23 April 2019</td>
</tr>
</tbody>
</table>

### A.1.10. Project contact details

<table>
<thead>
<tr>
<th>Contact person, position</th>
<th>Jose Padilla</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>UNDP</td>
</tr>
<tr>
<td>Email address</td>
<td><a href="mailto:Jose.padilla@undp.org">Jose.padilla@undp.org</a></td>
</tr>
<tr>
<td>Telephone number</td>
<td>+66 2 304 9100 ext 2730</td>
</tr>
<tr>
<td>Mailing address</td>
<td>3rd Floor UN Service Building, Rajdamnern Nok Ave, Phranakorn, Bangkok 10200, Thailand</td>
</tr>
</tbody>
</table>

### 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.)
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

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Expected approval from accredited entity’s Board (if applicable)</td>
<td>12 Jun 2019</td>
</tr>
<tr>
<td>Expected financial close (if applicable)</td>
<td>TBD (Date of agreement on the FAA between UNDP and GCF)</td>
</tr>
</tbody>
</table>
| 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 6,11,6092 (cash) provided by the GoRMI to meet baseline water requirements.

<table>
<thead>
<tr>
<th>Table 1: Financial Elements per project outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output</strong></td>
</tr>
<tr>
<td>Output 1: Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Output 1 Sub Total</strong></td>
</tr>
<tr>
<td>Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
programmes on efficient usage (demand management) of rainwater

### Output 2 Sub Total

<table>
<thead>
<tr>
<th></th>
<th>Amount 1</th>
<th>Amount 2</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2,696,128</td>
<td>0</td>
<td>2,696,128</td>
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</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th></th>
<th>Amount 1</th>
<th>Amount 2</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>1,502,330</td>
<td>0</td>
<td>1,502,330</td>
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</table>

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

<table>
<thead>
<tr>
<th></th>
<th>Amount 1</th>
<th>Amount 2</th>
<th>Total</th>
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<tr>
<td></td>
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### Output 3 Sub Total

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<tbody>
<tr>
<td></td>
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### Project Management Cost

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<th>Amount 2</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>735,027</td>
<td>554,609</td>
<td>1,289,636</td>
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</table>

### Total Project Financing

<table>
<thead>
<tr>
<th></th>
<th>Amount 1</th>
<th>Amount 2</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18,631,216</td>
<td>6,116,092</td>
<td>24,747,308</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>25-year Project Budget</th>
<th>0 - 7 years</th>
<th>8 - 25 Years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GCF</td>
<td>GRMI</td>
<td>GCF</td>
</tr>
<tr>
<td>Capital Costs</td>
<td>18,173,560</td>
<td>5,844,047</td>
<td>-</td>
</tr>
<tr>
<td>Sustenance CAPEX</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>O&amp;M Costs</td>
<td>457,656</td>
<td>272,045</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>18,631,216</td>
<td>6,116,092</td>
<td>0</td>
</tr>
</tbody>
</table>

### B.2. Project Financing Information

<table>
<thead>
<tr>
<th>Financial Instrument</th>
<th>Amount</th>
<th>Currency</th>
<th>Tenor</th>
<th>Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Total project financing</td>
<td>(a) = (b) + (c)</td>
<td>$24.747</td>
<td>million USD ($)</td>
<td></td>
</tr>
</tbody>
</table>
(b) GCF financing to recipient

| (i) Senior Loans | Options |   | ( ) years |   | ( ) % |
| (ii) Subordinated Loans | Options |   | ( ) years |   | ( ) % |
| (iii) Equity | Options |   |   |   | ( ) % IRR |
| (iv) Guarantees | Options |   |   |   |   |
| (v) Reimbursable grants * | $18.631 million USD ($) |   |   |   |   |
| (vi) Grants * |   |   |   |   |   |

* 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.

<table>
<thead>
<tr>
<th>Total requested (i+ii+iii+iv+v+vi)</th>
<th>$18.631 million USD ($)</th>
</tr>
</thead>
</table>

(c) Co-financing to recipient

<table>
<thead>
<tr>
<th>Financial Instrument</th>
<th>Amount</th>
<th>Currency</th>
<th>Name of Institution</th>
<th>Tenor</th>
<th>Pricing</th>
<th>Seniority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant</td>
<td>6.116 million USD ($)</td>
<td>RMI Government</td>
<td></td>
<td></td>
<td>Options</td>
<td></td>
</tr>
</tbody>
</table>

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 km², spread across over 2 million km² 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 km², 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 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. Approximately 20% of population of RMI has been reported to be living on less than USD 1 a day.

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. 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 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 – 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. With climate change projections for RMI indicating that droughts are to become longer,
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.

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”.

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.

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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

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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

<table>
<thead>
<tr>
<th>Climate Region</th>
<th>Baseline Drought Length Days (Climate Model)*</th>
<th>Baseline Drought Length Observed**</th>
<th>Projected Additional days of Drought 2025-35 or 2035-45***</th>
<th>Projected Drought Length up to 2045</th>
<th>Observed Length of 2015/16 Drought</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>60</td>
<td>90</td>
<td>20</td>
<td>110</td>
<td>134</td>
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<tr>
<td>2</td>
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<td>7</td>
<td>30</td>
<td>40</td>
<td>19</td>
<td>59</td>
<td>91</td>
</tr>
</tbody>
</table>

* 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 16 cm (Y2030) to 22 to 62 cm (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 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

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\(^{10}\) Ailuk, Aur, Ebadon, Lae, Lib, Makaelap, Mejatto, Ujaje, 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.


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 of 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\textsuperscript{13} reported that 89\% of households had rainwater-harvesting systems of at least one tank storage. For the average household\textsuperscript{14}, at a water consumption level of 20 lpcd\textsuperscript{15}, the larger size rainwater tanks (5,678L) could last up to 47 days.

57. Approximately 79\%\textsuperscript{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\textsuperscript{2} for households and 100m\textsuperscript{2} to more than 400m\textsuperscript{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.

\textit{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\textsuperscript{3}\textsuperscript{17} to 453m\textsuperscript{3} were recorded as still being in use and attached to buildings with a roof area greater than 100m\textsuperscript{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\textsuperscript{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, Ujaje and Lae atolls.

\textsuperscript{13} Ailuk, Aur, Ebadon, Lae, Lib, Malelap, Mejatto, Ujaje, Utrik, Wotho, and Wotje. Source. 2013 Wash Survey.
\textsuperscript{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.
\textsuperscript{15}WHO and SDG minimum standard to provide for drinking, cooking and basic hygiene
\textsuperscript{16} Based on 2011 RMI Census
\textsuperscript{17} One m\textsuperscript{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 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, Makelap 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\textsuperscript{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 sanitation 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

\textsuperscript{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 Region21. 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:

<table>
<thead>
<tr>
<th>Country</th>
<th>Population Served (%)</th>
<th>Water Per Person (lpcd)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marshall Islands</td>
<td>74%</td>
<td>27 (38 planned22)</td>
<td>Provision only in Majuro and Kwajalein. Rural areas rely on rainwater harvesting, some groundwater and in a few locations, desalination water</td>
</tr>
<tr>
<td>Kiribati</td>
<td>43%</td>
<td>2 (60 lpcd planned 23)</td>
<td>Provision of water only to capital town. Rural areas rely on rainwater harvesting</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>19%</td>
<td>130</td>
<td>Provision of water only to capital and provincial towns. Rural areas rely on rainwater harvesting</td>
</tr>
<tr>
<td>Tuvalu</td>
<td>50%</td>
<td>5</td>
<td>Public Works tanker distribution of rainwater &amp; desalination water</td>
</tr>
<tr>
<td>Nauru</td>
<td>98%</td>
<td>16</td>
<td>Desalination water</td>
</tr>
</tbody>
</table>

20 This volume of water meets the requirements for short duration (<2 weeks) water availability based on WHO Guideline and Sphere Standard
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\textsuperscript{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:

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Period (Funding)</th>
<th>Main interventions and location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan Grassroots Grant</td>
<td>1997 to ongoing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(approx. $1.5M)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grass Root Grants: Water Tank Truck for Enewetak Atoll,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Two 20,000 Gallon Cisterns at Woja and Bouj (Ailinglaplap Atoll), One</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50,000 Gallon Cistern at Mejit</td>
<td></td>
</tr>
<tr>
<td>Government of Japan Non-Project Grant Aid</td>
<td>2009 to ongoing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solar electrical systems connected to MEC,</td>
<td></td>
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<tr>
<td></td>
<td>3 diesel powered desalination units 13200 Gal/day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment for water quality test kits</td>
<td></td>
</tr>
<tr>
<td>GIZ – Adapting to Climate Change and Sustainable Energy Project</td>
<td>2016-2017 ($800k)</td>
<td>Enhancing RWH systems at the three boarding schools. (Jaluit, Wotje and Kwajalein (Gugeegue))</td>
</tr>
<tr>
<td>Public Works - Public Schools and Atoll Health Care Centre Upgrades</td>
<td>2016 - ongoing ($1.9 M)</td>
<td>Replacement and upgrade of school infrastructure and health facility - 30 new tanks were installed in 2017 (size ranging from 47 to 189 m$^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.</td>
</tr>
</tbody>
</table>

**Desalination**

| 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. |

**Water Governance**


**Capacity Building**

\textsuperscript{24} WHO Technical Note No. 9, WHO/SEARO Technical Notes: Minimum Water Quantity needed for domestic uses
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**

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

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25 Planned interventions reviewed and incorporated into the calculation of number of days where community RWH systems are empty (or drought days).

• **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 ground water 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>
<thead>
<tr>
<th>Table C2.2 Adaptation options considered</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Technology Option</th>
<th>Water Source</th>
<th>Lessons Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household rainwater harvesting system</td>
<td>Rainwater</td>
<td>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</td>
</tr>
<tr>
<td>Community rainwater harvesting system</td>
<td>Rainwater</td>
<td>Provision on larger catchments connected to community buildings – Improved 150mm 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.</td>
</tr>
<tr>
<td>Groundwater infiltration galleries</td>
<td>Groundwater</td>
<td>Protection from contamination, improved performance and understanding of water lens thickness and capacity.</td>
</tr>
<tr>
<td>Groundwater wells</td>
<td>Groundwater</td>
<td>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.</td>
</tr>
<tr>
<td>Groundwater wells with pumps (hand pumps, solar pumps, Hydraulic Ram Pumps)</td>
<td>Groundwater</td>
<td>Good efficient use of groundwater resource. More efficient than using bucket and rope – ensures protection from contamination.</td>
</tr>
<tr>
<td>Desalination: Solar distillation (solar water purifiers)</td>
<td>Sea water or brackish groundwater</td>
<td>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.</td>
</tr>
<tr>
<td>Desalination: Reverse Osmosis units – mobile</td>
<td>Sea water or brackish groundwater</td>
<td>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.</td>
</tr>
<tr>
<td>Desalination: Reverse Osmosis units – stationary</td>
<td>Sea water or brackish groundwater</td>
<td>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.</td>
</tr>
<tr>
<td>Hoop system (hybrid mini poly tunnel)</td>
<td>Air moisture – condensation units</td>
<td>Limited capacity to provide water source. Can be used for awareness training – education.</td>
</tr>
</tbody>
</table>

### 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

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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 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.
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
o 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
  o Establish a comprehensive national database for water resources in RMI that will be updated, and sustained.
  o 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)
    o 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 Ila 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 m³ of water, whereas for climate change induced drought periods, it requires, on top of baseline needs, a further addition of 9,161 m³ 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 729,701 will 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 77 communities 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 m² 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.

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

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 4.5m³ (1,200 gallon) or 5.6 m³ (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 50m³ 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>
<thead>
<tr>
<th>Pre-project context</th>
<th>Intended post project context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average of 50% of roof area used for RWH</td>
<td>100% of roof area used for RWH</td>
</tr>
<tr>
<td>Currently at average 35% efficiency due to poor condition</td>
<td>Efficiency improved to at least 80%</td>
</tr>
<tr>
<td>100mm guttering systems</td>
<td>150mm diameter gutters</td>
</tr>
<tr>
<td>100mm diameter downpipes</td>
<td>150mm diameter downpipes</td>
</tr>
<tr>
<td>One 4.5m³ (1,200 gallon) or 5.7m³ (1,500 gallon) tanks</td>
<td>Minimum of 50m³ of storage capacity installed</td>
</tr>
<tr>
<td>Most without first flush diverters or mosquito guards.</td>
<td>First flush diverter installed</td>
</tr>
<tr>
<td></td>
<td>Insect screens installed</td>
</tr>
</tbody>
</table>

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.

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

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
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.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 XIII h. 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](image)

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:** Oversees 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

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

<table>
<thead>
<tr>
<th>TASK</th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
<th>YEAR 4</th>
<th>YEAR 5</th>
<th>YEAR 6</th>
<th>YEAR 7</th>
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<tbody>
<tr>
<td></td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
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<tr>
<td>Output 1. Implementation of optimal mix of interventions to ensure climate resilient water security in outer atolls and islands of RMI</td>
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<tr>
<td>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</td>
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<td>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</td>
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<td>Activity 2.1. Protect groundwater wells from more frequent climate change induced storm surges and contaminations</td>
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</table>
### Activity 2.2.
Enhance women and youth’s leadership through best practices and community awareness programmes on efficient usage (demand management) of rainwater.

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

<table>
<thead>
<tr>
<th>Activity 3.1.</th>
<th>Update national-level contingency plans and Standard Operating Procedures (SOPs) for climate change induced drought response</th>
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<tbody>
<tr>
<td>Activity 3.2.</td>
<td>Develop and implement community-level drought contingency planning in outer islands and atolls</td>
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</tbody>
</table>

| Project Management |
|--------------------|-------------------------------------------------|
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. However, the RMI PDNA 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. 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.

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. 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 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.

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.

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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 XIIIId-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.

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33 ibid
34 http://www.imf.org/en/News/Articles/2015/09/28/04/52/mcs100711#top
36 http://pcrafi.spc.int/
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 maintenance 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

<table>
<thead>
<tr>
<th>GCF core indicators</th>
<th>Annual</th>
<th>Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected tonnnes of carbon dioxide equivalent (t CO₂ eq) to be reduced or avoided (Mitigation only)</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>• Expected total number of direct and indirect beneficiaries, disaggregated by gender (reduced vulnerability or increased resilience);</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Number of beneficiaries relative to total population, disaggregated by gender (adaptation only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Approximately 15,572 (2017) direct beneficiaries (28% of the population of RMI) (of which 49% are female)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Approximately 55,226 (2017) indirect beneficiaries (of which 49% are female)</td>
<td></td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>100% - Direct and indirect beneficiaries represent the total population of RMI</td>
<td></td>
</tr>
</tbody>
</table>

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
- SOP's developed
- Number of people with strengthened capacity

192. All rural 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 (refer Annex II Feasibility Study Annex 2).

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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.
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.

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**Figure E2.2 Theory of Change**

- **Inputs**: 2. Optimization of alternative water sources to reduce reliance on harvested rainwater in context of reduced rainfall
- **Outputs**: 1. Implementation of optimal mix of interventions to ensure water security in outer atolls and islands of RMI
- **Outputs**: 3. Climate change drought preparedness and response measures implemented in outer atolls and islands
- **Outcomes**: Increase water availability to close the water supply-demand gap
- **Outcomes**: Enhance the ability of RMI to prepare and respond to climate change induced drought events
- **Fund-Level Impact**: Increased resilience of health and well-being, and food and water security for the most vulnerable people and communities

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**Barriers to be Addressed**

- Insufficient water infrastructure, not resilient to prolonged drought, leading to lack of, and shortage of safe freshwater for people living in low-lying atolls and islands
- Insufficient rainwater catchment systems for current storage capacity, due to rainfall variability
- Open groundwater wells susceptible to contamination by debris and by wave overtopping, especially during king tides
- Limited access and availability, and systemising knowledge, of alternative sources of water for household and community usage
- Limited participation and empowerment of women and youth in efficient water management practices
- Unstable and ineffective operation and maintenance practices in place
- Limited disaster early warning and communication between Majuro and outer atolls and islands

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**Figure E2.1. Example of cost curve methodology**

[Graph showing cost curve methodology with labels and figures]
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 throughout 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 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 i.e. 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 GCF’s website and forums such as the Structured Dialogues.

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

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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 policies 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).


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)\(^\text{41}\). 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\(^\text{42}\). This socio-economic

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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. 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 km² 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, 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. 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.

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 31,307 of 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 as are 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$1.18 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.

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• 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 (SDGs) – 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 (HAChoT) 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 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 rehabiliting 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):

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>
<thead>
<tr>
<th>Intervention Type</th>
<th>Max # interventions</th>
<th># Cost-effective interventions</th>
<th>% included</th>
</tr>
</thead>
<tbody>
<tr>
<td>CB RWH Improvement &amp; Storage</td>
<td>155</td>
<td>147</td>
<td>95%</td>
</tr>
<tr>
<td>CB RWH roofs</td>
<td>445</td>
<td>140</td>
<td>31%</td>
</tr>
<tr>
<td>HH RWH Improvement</td>
<td>2,524</td>
<td>1635*</td>
<td>65%</td>
</tr>
<tr>
<td>Concrete Tanks Rehabilitation</td>
<td>23</td>
<td>-</td>
<td>0%</td>
</tr>
<tr>
<td>Mobile RO</td>
<td>54</td>
<td>-</td>
<td>0%</td>
</tr>
</tbody>
</table>

* 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 implementability, 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>
<thead>
<tr>
<th>Table E61.2. Overview of final interventions to meet the water security target (differentiated by baseline and climate induced drought)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total m³</strong></td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Baseline Drought</strong></td>
</tr>
<tr>
<td><strong>CC RWH roofs</strong></td>
</tr>
<tr>
<td><strong>Concrete Tanks Rehab</strong></td>
</tr>
</tbody>
</table>
### HH RWH Improvement

<table>
<thead>
<tr>
<th></th>
<th>6,733.05</th>
<th>1,937</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-total</strong></td>
<td>11,302.30</td>
<td></td>
</tr>
</tbody>
</table>

#### Climate Change Additionality Drought

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost</th>
<th>No. of Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC RWH Improvement &amp; Storage</td>
<td>4,170.69</td>
<td>89</td>
</tr>
<tr>
<td>CC RWH roofs</td>
<td>4,032.00</td>
<td>92</td>
</tr>
<tr>
<td>Concrete Tanks Rehab</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>HH RWH Improvement</td>
<td>957.93</td>
<td>311</td>
</tr>
<tr>
<td><strong>Sub-total</strong> CC RWH Improvement &amp; Storage</td>
<td>9,160.62</td>
<td></td>
</tr>
<tr>
<td>CC RWH roofs</td>
<td>5,396.37</td>
<td>121</td>
</tr>
<tr>
<td>Concrete Tanks Rehab</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>HH RWH Improvement</td>
<td>7,690.97</td>
<td>2,248</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>20,462.93</td>
<td>158</td>
</tr>
<tr>
<td><strong>Additional HH RWH for social equity</strong></td>
<td>345.28</td>
<td>281</td>
</tr>
<tr>
<td><strong>Grand Total (incl. 100% HH RWH)</strong></td>
<td>20,808.21</td>
<td>121</td>
</tr>
</tbody>
</table>

#### 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.

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E.6.5. Key efficiency and effectiveness indicators

<table>
<thead>
<tr>
<th>GCF core indicators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated cost per t CO₂ eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>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)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project/programme)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Weather Stations 1-4 (Northern Atolls)</th>
<th>20 day drought</th>
<th>30 day drought</th>
<th>60 day drought</th>
<th>typical but impactful drought</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (2017) affected</td>
<td>2657</td>
<td>2779</td>
<td>7619</td>
<td>9572</td>
</tr>
<tr>
<td>% total population (2017)</td>
<td>0.28</td>
<td>0.39</td>
<td>0.80</td>
<td>1.00</td>
</tr>
<tr>
<td>frequency (1 in x years) (2017-2034)</td>
<td>1.23</td>
<td>2.33</td>
<td>5.38</td>
<td>6.00</td>
</tr>
<tr>
<td>frequency (1 in x years) (2035-2045)</td>
<td>0.93</td>
<td>1.32</td>
<td>4.29</td>
<td>5.00</td>
</tr>
<tr>
<td># days (2017-2034)</td>
<td>70</td>
<td>30</td>
<td>60</td>
<td>78</td>
</tr>
<tr>
<td># days (2035-2045)</td>
<td>72</td>
<td>47</td>
<td>95</td>
<td>117</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weather Stations 5-7 (Southern Atolls)</th>
<th>20 day drought</th>
<th>30 day drought</th>
<th>60 day drought</th>
<th>typical but impactful drought</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (2017) affected</td>
<td>3,724</td>
<td>4,379</td>
<td>5,771</td>
<td>6,000</td>
</tr>
<tr>
<td>% total population (2017)</td>
<td>0.62</td>
<td>0.73</td>
<td>0.96</td>
<td>1.00</td>
</tr>
<tr>
<td>frequency (1 in x years) (2017-2034)</td>
<td>2.77</td>
<td>6.03</td>
<td>31.50</td>
<td>6.00</td>
</tr>
<tr>
<td>frequency (1 in x years) (2035-2045)</td>
<td>1.68</td>
<td>5.29</td>
<td>12.18</td>
<td>5.00</td>
</tr>
<tr>
<td># days (2017-2034)</td>
<td>20</td>
<td>30</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td># days (2035-2045)</td>
<td>31</td>
<td>46</td>
<td>93</td>
<td>61</td>
</tr>
</tbody>
</table>

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. 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. 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’. 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.\textsuperscript{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 positive 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 quantify 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

\textsuperscript{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: 

\textsuperscript{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.

\textsuperscript{51} Information provided by NDMO

\textsuperscript{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).

\textsuperscript{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 rises 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](https://popp.undp.org/). Further guidance is outlined in the financial resources management section of the UNDP Programme and Operations Policies and Procedures available at [here](https://popp.undp.org/). 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](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%20Direct%20Implementation%20(DIM)%20Modality.docx&action=default&DefaultItemOpen=1](https://popp.undp.org/_layouts/15/WopiFrame.aspx?sourcedoc=/UNDP_POPP_DOCUMENT_LIBRARY/Public/FRM_Financial%20Management%20and%20Implementation%20Modality%20Direct%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:

![Diagram of financial management and procurement]

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Risk category</th>
<th>Level of impact</th>
<th>Probability of risk occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>International supply chains are long, expensive and prone to shipping delays. Country staff have little/negligible experience of international procurement procedures</td>
<td>Technical and operational</td>
<td>High (&gt;20% of project value)</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Description</th>
<th>Risk category</th>
<th>Level of impact</th>
<th>Probability of risk occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project sites are located across separate atolls/islands, dependent on inter-island transport. Transport delays could delay implementation.</td>
<td>Technical and operational</td>
<td>Medium (5.1-20% of project value)</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Description</th>
<th>Risk category</th>
<th>Level of impact</th>
<th>Probability of risk occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited in-country technical, managerial and procurement expertise in critical project areas</td>
<td>Technical and operational</td>
<td>Medium (5.1-20% of project value)</td>
<td>Medium</td>
</tr>
<tr>
<td>Inappropriate or inadequate delegates at training workshops</td>
<td>Technical and operational</td>
<td>Medium (5.1-20% of project value)</td>
<td>Medium</td>
</tr>
<tr>
<td>Conflicting demands on key governmental and non-governmental staff</td>
<td>Technical and operational</td>
<td>Medium (5.1-20% of project value)</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Selected Risk Factor 4</th>
<th>Extreme Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>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 &amp; recovery priorities for government and communities.</td>
</tr>
<tr>
<td>Risk category</td>
<td>Social and environmental</td>
</tr>
<tr>
<td>Level of impact</td>
<td>High (&gt;20% of project value)</td>
</tr>
<tr>
<td>Probability of risk occurring</td>
<td>Low</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Selected Risk Factor 5</th>
<th>Community Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Communities not committed to effort required to strengthen capacity in adaptive management, preferring government hand-outs and infrastructure gifts.</td>
</tr>
<tr>
<td>Risk category</td>
<td>Social and environmental</td>
</tr>
<tr>
<td>Level of impact</td>
<td>Medium (5.1-20% of project value)</td>
</tr>
<tr>
<td>Probability of risk occurring</td>
<td>Medium</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Risk category</th>
<th>Level of impact</th>
<th>Probability of risk occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>Other</td>
<td>High (&gt;20% of project value)</td>
<td>Low</td>
</tr>
</tbody>
</table>

**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

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

**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

<table>
<thead>
<tr>
<th>Description</th>
<th>Risk category</th>
<th>Level of impact</th>
<th>Probability of risk occurring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project activities result in collateral environmental degradation.</td>
<td>Social and environmental</td>
<td>Low (&lt;5% of project value)</td>
<td>Low</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Selected Risk Factor 9</th>
<th>Inequitable Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Risk category</td>
</tr>
<tr>
<td>Limited involvement and participation of women and other marginalized groups in project implementation.</td>
<td>Social and environmental</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Paradigm shift objectives</th>
<th>Expected Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased climate-resilient sustainable development</td>
<td>Addressing Climate Vulnerabilities in the Water Sector (ACWA) in the Marshall Islands</td>
</tr>
</tbody>
</table>

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 inhabited 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 20% 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

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Means of Verification (MoV)</th>
<th>Baseline</th>
<th>Target</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2.0 Increased resilience of health and well-being, and food and water security</td>
<td>A2.1 Number of males and females benefiting from improved health due to safe drinking water supply despite climate shocks and stresses</td>
<td>Project baseline, mid-term and end-term surveys.</td>
<td>&lt;5% of population</td>
<td>100% target population with access to safe</td>
</tr>
</tbody>
</table>

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 | As above | Households and communities are properly trained in the use and maintenance of water infrastructure. | to be women; 25 per cent of all beneficiaries to be youth | drinking water (50 per cent of the beneficiary population to be women; 25 per cent of all beneficiaries to be youth)
### A3.0 Increased resilience of infrastructure and the built environment to climate change

<table>
<thead>
<tr>
<th>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)</th>
<th>Project baseline, mid-term and end term surveys.</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2 Number of new infrastructure projects or physical assets strengthened or constructed to withstand conditions resulting from climate variability and change</td>
<td>Sustained operation and maintenance created through the Project</td>
<td>None</td>
</tr>
</tbody>
</table>

- **1293 household s and 79 community buildings made resilient**
- **2586 household s and158 community buildings made resilient**

---

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

<table>
<thead>
<tr>
<th>Expected Result</th>
<th>Indicator</th>
<th>Means of Verification (MoV)</th>
<th>Baseline</th>
<th>Target</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project/programme Outcomes</strong></td>
<td>Outcomes that contribute to Fund-level impacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A7.0 Strengthened adaptive capacity and reduced exposure to climate risks</strong></td>
<td></td>
<td>Project baseline, mid-term and end term surveys</td>
<td>0</td>
<td>50% of households in targeted communities have upgraded or new RWH and storage (the project will target 49% female headed households)</td>
<td>Infrastructure, adapted rural life activities and climate services are completed and implemented successfully in the 23 local government jurisdictions</td>
</tr>
</tbody>
</table>

| **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** | | Number of households, and community buildings with upgraded existing rooftop rainwater harvesting systems (surveys collected through CWCs) | 11,302 m³ of water required to achieve the baseline drought, and an additional 19,161 m³ of climate change induced drought periods | 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. |
### RESULTS MONITORING AND REPORTING

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<table>
<thead>
<tr>
<th>Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.2 Additional (new) rainwater harvesting and storage systems for communities in outer islands and atolls</strong></td>
</tr>
<tr>
<td>Number of community buildings with improved efficiency of rainwater harvesting systems and increased storage capacity (surveys collected through CWGs)</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>60 new community roof/storage systems</td>
</tr>
<tr>
<td>121 new community roof/storage systems installed</td>
</tr>
<tr>
<td>Government and local authorities are willing to adjust existing planning instruments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.1 Number of protect groundwater wells from more frequent storm surges and contamination</strong></td>
</tr>
<tr>
<td>Project baseline, mid-term and end term surveys, Mid-term review and terminal evaluation</td>
</tr>
<tr>
<td>2,586 household and community groundwater wells open to contamination by seawater</td>
</tr>
<tr>
<td>50% groundwater wells protected</td>
</tr>
<tr>
<td>100% target wells households and community groundwater wells will be protected from storm surges and contamination in 77 target rural communities</td>
</tr>
<tr>
<td>No major disaster occurs in the project locations that may delay the implementation of groundwater wells protection at household and community level</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output 2: Optimization of alternative water sources to reduce reliance on harvested rainwater in the context of reduced rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2.2 Strengthened local capacities and enhanced women and youth’s leadership through best practices</strong></td>
</tr>
<tr>
<td>Project baseline, mid-term and end term reviews, that includes results from assessment and monitoring systems created by the Project</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>&gt;50% of training participants who have adopted the best practices (disaggregated by gender)</td>
</tr>
<tr>
<td>100% of training participants who have adopted the best practices (disaggregated by gender)</td>
</tr>
<tr>
<td>Sufficient interest and participation from community partners on training opportunities and workshops</td>
</tr>
<tr>
<td>Activities</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>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</td>
</tr>
<tr>
<td>3.2 Number of developed and implemented community-level drought contingency planning in outer islands and atolls</td>
</tr>
</tbody>
</table>
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

Additional roof systems will be constructed to meet the community water demand and close the water gap.

Activity 1.2.1. Build new roof catchment systems

Activity 1.2.2. Build new storage tanks

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

Existing water infrastructure will be climate proofed by raising the height of groundwater wells, and extending the surface concrete slab to 2m.

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 measures 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
**H.2. Arrangements for Monitoring, Reporting and Evaluation**

<table>
<thead>
<tr>
<th>Activity 3.2. Develop and implement community-level drought contingency planning in outer islands and atolls</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>H.2. Arrangements for Monitoring, Reporting and Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
<tr>
<td>335. Project-level monitoring and evaluation will be undertaken in compliance with the UNDP POPP and the UNDP Evaluation Policy.</td>
</tr>
<tr>
<td>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 &amp; Evaluation (M&amp;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.</td>
</tr>
<tr>
<td>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&amp;E requirements as outlined in the UNDP POPP. Additional M&amp;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&amp;E.</td>
</tr>
<tr>
<td>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&amp;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</td>
</tr>
</tbody>
</table>
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 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

<table>
<thead>
<tr>
<th>Document Type</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>☒ NDA No-objection Letter</td>
<td>(Annex I)</td>
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<tr>
<td>☒ Feasibility Study</td>
<td>(Annex II)</td>
</tr>
<tr>
<td>☐ Integrated Financial Model</td>
<td>that provides sensitivity analysis of critical elements</td>
</tr>
<tr>
<td>☒ Confirmation letter</td>
<td>or letter of commitment for co-financing commitment</td>
</tr>
<tr>
<td>☒ Project/Programme Confirmation/Term Sheet</td>
<td>(including cost/budget breakdown, disbursement schedule, etc.)</td>
</tr>
<tr>
<td>☒ Environmental and Social Impact Assessment/Social and Environmental Screening Template</td>
<td>(Annex VIa)</td>
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<tr>
<td>☒ Environmental and Social Management Framework (ESMF)</td>
<td>(Annex VIb)</td>
</tr>
<tr>
<td>☒ Appraisal Report or Due Diligence Report</td>
<td>with recommendations</td>
</tr>
<tr>
<td>☐ Evaluation Report of the baseline project</td>
<td>(Annex VIII) – Not Applicable</td>
</tr>
<tr>
<td>☒ Map indicating the location of the project/programme</td>
<td>(Annex IX)</td>
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</tbody>
</table>

### 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 XIIa) |
- ☒ Operations and Maintenance Plan | (Annex XIIib) |
- ☒ Gender Assessment and Action Plan | (Annex XIIc) |
- ☒ Stakeholder Consultation Report | (Annex XIIId-1) |
- ☒ Stakeholder Engagement Plan | (Annex XIIId-2) |
- ☒ Detailed budget and work plan | (Annex XIIe) |
- ☒ HACT Assessment | (Annex XIIIf)- Not Applicable for DIM |
- ☒ Project activities and responsibilities | (Annex XIIg) |
- ☒ Any other relevant document for submission | (Official request for DIM from RMI Gov)-Annex XIIh |
- ☒ 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.*