

Country:	Namibia
Request Identification Number:	2014-017/NAM-01

Title:	Identification and prioritization of technologies to address water scarcity and climate change impacts in Namibia
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Project summary

Namibia is a water scarce country as it is situated in the semi-arid subtropical belt of the Southern Hemisphere. As such, the objective of the technical assistance that is provided herein is an analysis of climate change adaptation technology options that are available for transfer to Namibia to enable the country's transition to sustainable water security, which will in turn contribute to human well-being and economic development. The ultimate aim of the Namibian government is a comprehensive water security master plan, a foundation of which will be outputs from the technology prioritization developed with support of this CTCN technical assistance.

Therefore, the objective of the CTCN technical assistance is to identify and prioritize climate change adaptation technologies for addressing water scarcity Namibia. This is envisaged to be a consultative and transparent process that will involve as much as possible, all the relevant stakeholders. The prioritized technologies will form a basis for developing up scaled water scarcity technology deployment and implementation projects. The technical assistance will then link these projects with financing mechanisms and investment possibilities.

In total, the CTCN envisages that the technical assistance will take a maximum of six months to perform the technology prioritization.

1. Overview of the assistance

1.1 Objectives (outcomes)

Namibia is a water scarce country as it is situated in the semi-arid subtropical belt of the Southern Hemisphere. As such, the objective of the technical assistance that is provided herein is an analysis of climate change adaptation technology options that are available for transfer to Namibia to enable the country's transition to sustainable water security, which will in turn contribute to human wellbeing and economic development. The ultimate aim of the Namibian government is a comprehensive water security master plan, a foundation of which will be outputs from the technology prioritization developed with support of this CTCN technical assistance.

1.2 Background

1.2.1 Namibian policy context for climate technology transfer for the water sector's adaptation to climate change

Technology transfer to enable climate change adaptation for the water sector in Namibia will take effect in the context of national development. This is largely informed by Vision 2030, the operational implementation of which is facilitated by a series of National Development Plans (NDPs, see Figure 1), thus suggesting that technology transfer in the water sector will be embedded in this process as the NDPs aim to inform updates of sector policies, plans and project that follow an integrated, sustainable development and approach.

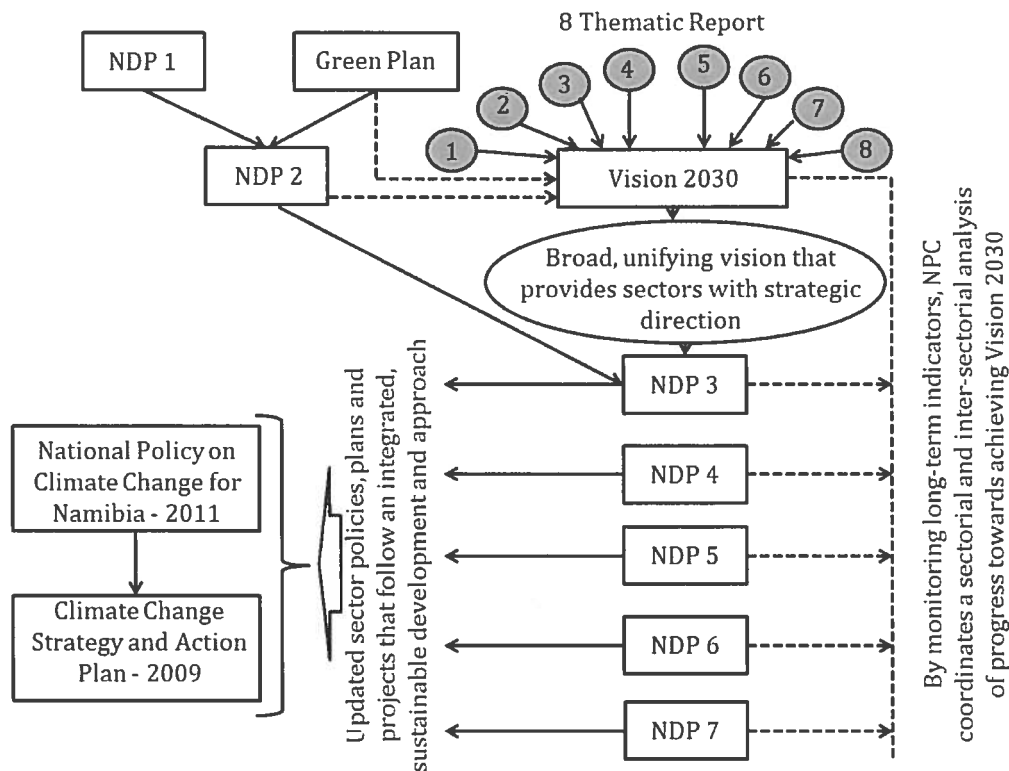


Figure 1: a schematic diagram showing Namibia’s Vision 2030, which is a broad unifying vision that provides sectors with strategic direction that must each operationalize through the development of strategies, and monitor through indicators. The sector strategies link with climate change policy, strategy and action plan through specific climate change actions. (Adapted from Vision 2030¹)

By 2030, the Namibian government envisages a situation where freshwater resources are free of pollution and are used to ensure social well-being, support economic development, and to maintain natural inhabitants. This vision will be supported by the objective of achieving equitable access to portable water and freshwater resources by all the people of Namibia. Various strategies will be employed to achieve this objective. From a CTCN technical assistance perspective, the main strategy, amongst others, to be employed to achieve this objective is the transfer and development of appropriate technologies for the promotion of freshwater saving. These activities will then feed into the short term NDPs. At the time of the development of this CTCN technical assistance, the fourth National Development Plan (NDP4) since the Namibian National Planning Commission commenced its work is operation for the period 2012/13 to 2016/17. The desired outcome therein is increased access to water for human consumption from 85.5 to 100% of the Namibian population, as well as sufficient

¹ http://www.npc.gov.na/?page_id=210

water reserves for industrialization, by the year 2017. This is on the backdrop of general good performance as indicated by the evaluation of preceding NDPs. From these documents, Namibia's national development goals are

- Poverty reduction;
- Employment creation;
- Promotion of economic empowerment;
- Stimulation of economic growth and the sustainability thereof;
- Narrowing the disparity in income;
- Reduction of regional development inequalities;
- Promotion of gender equality and equity;
- Environmental and ecological sustainability enhancement; and
- Combat the spread of HIV/AIDS

As noted above, the strategic implementation of Vision 2030 feeds into sector specific processes. From a legislative point of view, the Water Resources Management Act (2004) provides directions for the management, development, protection, conservation and use of water resources. The technology focus in the Act addresses efficiency in improved water technology, particularly improvements in irrigation technology. This is crucial as irrigation accounts for about 45.8% of the national water consumption. The development of water resources that the Act caters for and which is a high level intervention by the Namibian government, is of relevance to this CTCN technical request. This will involve domestic and international technology transfer. These include drought mitigation technologies as outlined in the National Drought Policy and Strategy (1997). The National Water Policy White Paper (NWPWP, 2000) also considers the important issue of water resources assessment, the objective of which is to development systems of water resource management that can deal effectively with the extreme hydrological risk and natural variability faced by Namibia.

The National Policy on Climate Change for Namibia (NPCCN, 2011) aims to develop and implement appropriate adaptation strategies and actions that will lower the vulnerability of Namibians and various sectors to the impact of climate change. As a legal framework, the policy recognizes that water availability is expected to be adversely affected by climate change impacts through increased variability of rainfall, temperature increases, prolonged and more severe droughts, declining soil moisture and increased evapotranspiration. As such the Namibian government undertakes to

- formulate and implement a strategy for harvesting and capturing water during the rainy season and provide guidelines for more efficient water use by sectors, households and individuals;
- be flexible in water use allocations and increase coverage of water supply and water treatment facilities across sectors, households and individuals targeting both rural and urban communities at local, regional and national level;
- promote and encourage integrated water resources management, including contingency planning for extreme events such as floods and droughts;

- promote and encourage artificial recharge of groundwater in arid and semi-arid environment;
- construct new water facilities, infrastructure and promote alternative water access e.g. desalinization and fog harvesting as well as optimizing the existing facilities; and
- prevention of water pollution.

There is now general agreement that there is great value in managing water resources within natural hydrological units such as river and lake basins, by conserving and protecting watersheds/catchment areas. Technology development and transfer in the water sector adaptation aspects of the Namibian climate change strategy and action plan – 2008 will firstly, in part, need to consider

- the development and management of watershed management plans;
- the promotion of soil and land conservation in watersheds;
- the restriction of access to and use of resources in watershed areas;
- the afforestation of degraded watershed area; and
- the decentralization of management of water resources to catchment management zones.

Secondly, as relevant to this CTCN technical assistance, the strategy recognizes the importance of Integrated Water Resource Management (IWRM) as a systematic process for sustainable development, allocation and monitoring of water resources. For this CTCN technical assistance, the former is the most important. Therefore to promote the integrated development and management of water resources, the Namibian government, together with supporting international structures, will need to consider

- the development and investment in additional methods of water supply;
- preparation against water disasters and protect water resources from floods as well as develop emergency works or structure; and
- maintenance of water infrastructure.

The above described the policy and strategy context in which climate technology transfer for adaptation of the water sector in Namibia should take place. The technology prioritization that is conducted and discussed in the next section should be on the basis of the above context and should respond to the needs identified in the policies, strategies and plans described above.

1.2 Outputs

The output of the project will be a prioritized list of water sector climate technologies for Namibia to address the water scarcity problem that the country is experiencing. The prioritized list will form the basis of bankable and fundable projects to transfer, deploy and implement these technologies to address this water scarcity problem.

1.3 Technology aspects

1.3.1 Water sector adaptation and their brief descriptions

Based on Namibia's Climate change Strategy and Action Plan as well as the Integrated Water Management Plan, a total of eight different types of technologies have been identified for prioritization. These are listed in Table 1, below. This list of technologies is indicative as the comprehensive list of technologies will be developed as part of the CTCN assistance.

Table 1: A list of climate change adaptation technologies

Technology name	Brief description
Tubewell/Borehole as a drought interventions for domestic water supply	A tubewell is a narrow, screened tube or casing driven into a water-bearing zone of the subsurface. The term tubewell is sometimes used synonymously with borehole. However, boreholes are more specifically defined as tubewells penetrating bedrock, with casing not extending below the interface between unconsolidated soil and bedrock. Tubewells can often be installed by hand-auguring; boreholes require a drilling method with an external power source.
Desalination	The removal of sodium chloride and other dissolved constituents from seawater, brackish waters, wastewater, or contaminated freshwater. Desalination can use a lot of energy, with corresponding negative impacts on climate change. However, technology innovations are enabling solar powered desalination at larger scales, and these opportunities will be explored through this technical assistance.
Efficient irrigation practices	Irrigation scheduling combined with sprinkler and drip irrigation technologies. Sprinkler irrigation is pressurised irrigation that consists of applying water to the soil surface using mechanical and hydraulic devices that simulate natural rainfall and drip irrigation is based on the constant application of a specific and calculated quantity of water to soil crops. These hard technologies can be used with irrigation scheduling which is the decision of when and how much water to apply to a field.
Leakage management, detection and repair in piped systems	Management, detection and repair of small leaks in a distribution system are critical functions of system operation and maintenance, yet they are often neglected.
Micro scale harvesting from ground surfaces-small reservoirs and micro catchments	Rainwater harvesting is defined as a method for inducing, collecting, storing and conserving local surface runoff (rain or surface water flow that occurs when soil is infiltrated to full capacity) for agriculture in arid and semi-arid regions. In the ground surface method water flowing along the ground during the rains is usually diverted toward a tank below the surface.

Micro scale rainwater harvesting from roof tops	In the roof-top method of rain water harvesting, water from rainfall is collected in vessels at the edge of the roof or channelled to a storage system via gutters and pipes.
Water reclamation and reuse	Water reclamation is the treatment or processing of wastewater to make it reusable with definable treatment reliability and meeting appropriate water quality criteria; water reuse is the use of treated wastewater (or reclaimed water) for a beneficial purpose.
Water saving	Conserving water doesn't just mean taking shorter shower or turning off the water while lathering your hands, when washing. There are other ways to save water nowadays that goes beyond these normal activities at home.

The above list of climate change adaptation technologies in the water sector constitute all the most commonly used technologies for the water sector. These will be priorities and will form the basis of a comprehensive water master plan for Namibia.

2. Description of the Assistance

The technical that will provided by CTCN will a consultative, objective and transparent prioritization of climate change adaptation technologies to address water scarcity in Namibia. It is proposed that the technology options be taken into consideration in this process be those that are listed in Table 1.

2.1 Activities

Activity 1 – Contextualization: Review and consolidation of development plans and climate change adaptation projects and prepare for stakeholder workshop for technology prioritization

Sub-activity 1.1 – Review of national policies, projects and programmes. A policy context for the technical assistance already exists in Namibia as outlined in subsection 1.2.1 above. This will need to be complemented by existing in-country projects and programmes that are aimed at addressing water stress issues in Namibia. In this sub-activity the technical assistance response plan will conduct a further review to ensure the existing material is up to date, including, and incorporate this in once document, including a review of policies, national development plans, sector plans, programmes and projects on water sector adaptation in Namibia.

Sub-activity 1.2 – Development of a list of technologies. A list of most promising technologies that can potentially contribute to climate change adaptation in Namibian water provision, efficiency and storage have been identified and described in subsection 1.2.2. This preliminary list will have to be agreed upon by the broader water sector stakeholders in Namibia. The agreement will be solicited through a stakeholder consultation process using surveys. This will serve as additional input into the workshops. In this data collection process, inputs about the weights that will be assigned to the technologies for MCA analysis will be requested at this stage of the technical analysis.

Deliverables	Delivery date
A report on a complete policy context for climate change adaptation technologies for the Namibian water sector.	1 months after inception of the technical assistance
A report on a complete inventory of climate change adaptation projects for the water sector and international water plans, together with an analysis of lessons learned from these.	2 months after inception of the technical assistance
A comprehensive list of technologies, including their main characteristics and pros and cons	2 months after inception of the technical assistance

Activity 2 – Face to face stakeholder consultation: A stakeholder workshop will be held to determine the direction of the technology prioritization for the water sector in Namibia. The main activities in the two day workshop will be to determine the various components of the multi criteria analysis (MCA) of the technology prioritization process, before it is actually conducted. The aim of the workshop will be to refine the preliminary work done (e.g. preliminary context analysis and wider information gathering) on certain aspects of the technology prioritization process outlined in Activity 3 below.

Sub-activity 2.1 – Together with Namibian government officials, identify key stakeholders that will participate in the workshop. The workshop participants might also include a few invited guests from countries that have developed their water master plans to provide guidance from their experience. This should be decided together with the Namibian government. The workshop will engage various stakeholders that can have a significant impact or contribute to the actual deployment of the technology identified (farmers associations, cooperatives, NGOs, technology providers, private sector, investors, etc.)

Sub-activity 2.2 – Define workshop agenda, organize and hold workshop in Namibia

Deliverables	Delivery date
List of stakeholders	3 months after inception of the technical assistance
Workshop agenda	
Background documents for the workshop	
Organisation of the workshop	3 months after inception of the technical assistance

Activity 3 – Technology prioritization: This process will form a large part of the workshop proceedings

Sub-activity 3.1 – Based on Activity 1, establish the decision context of the technology prioritization and establish and state the broader objectives of the analysis.

Sub-activity 3.2 – Identification of technologies. A preliminary description of the technologies that will be considered in the technical assistance are briefly described in Section 1.3.1. However for the technology prioritization more information on these technologies will need to be compiled. This information can be categorized as follows

- A more complete description of the technologies;

- Strengths and weaknesses of the technologies as well as their advantages and disadvantages, including social, economic and environmental impacts;
- Financial requirements and costs;
- Institutional and organizational requirements;
- Barriers to implementation and an analysis of whether these barriers exist in Namibia; and
- Opportunities for implementation.

Sub-activity 3.2 – Identification of criteria. Based on the policy and developmental context, criteria against which the technologies will be ranked will be identified. The information required for this analysis will be collected in Activity 1. This will mainly be a function of the workshop; however some preparation before the workshop will be useful.

Sub-activity 3.3 – Ranking of the technologies during the workshop. The outcome and performance of each technology will be evaluated against each of the criteria identified in Activity 3.2 and a workshop consensus around a particular score will need to be reached. It is recommended by the UNEP DTU MCA guide that all disagreement be recorded and so that a sensitivity analysis is then conducted at a later stage.

Sub-activity 3.4 – Assign weights to each of the criteria. Based on the preliminary national data collection and decisions of the workshop participants, weights will be assigned to each criterion.

Sub-activity 3.5 – Combine weights and scores, and conduct sensitivity analysis.

Sub-activity 3.6 – Compile a technology prioritization report as an outcome of the workshop proceedings. This will also complement the initial online survey in Activity 1.1.

Deliverables	Delivery date
A report on results from survey to collect information that will serve as input into the technology prioritization workshop for climate change adaptation in Namibia. The questionnaire would have to be developed and distributed widely in Namibia during the first month of the assistance and inputs closing date could be in the second month.	3 months after inception of the technical assistance.
Final report incorporating earlier reports on context and results from the workshop on technology prioritization	6 months after inception of request.
Technology brief on the prioritized water scarcity technologies	7 months after inception of request

Activity 4 – Investment aspects: Provide support to identify opportunities for financial investment and/or technical assistance to deploy and scale up the highest ranked technology solutions.

Sub-activity 4.1- Catalogue/list of prioritized technologies for the highest ranked technology solutions. This will include practical indicators on what projects have used these technologies, how successful they were, their cost, where to find them (local or international), who produce them and who sell them.

Sub-activity 4.2 – Identify opportunities for financial investment and/or technical assistance to deploy and scale up the highest ranked technology solutions. This will involve the suggestion of specific next steps and approaches for seeking international cooperation, international and domestic private sector, and/or domestic public financing for deployment or scaling up of the highest priority technology solutions. The technical assistance implementers will also serve as technical experts in presenting the findings to national decision makers, in coordination with the NDE and Proponent and make introductions to potential technology providers for specific technology solutions.

Sub-activity 4.3 – Develop project concepts notes (with stakeholders) for the prioritized water scarcity technologies for presentation to funders.

Sub-activity 4.4 – Conduction of a roundtable of investors to present the prioritized technologies and associated projects

Deliverables	Delivery date
Catalogue of prioritized technologies	8 months after inception of request
Project concepts for investors	8 months after inception of request
Roundtable agenda and report	8 months after inception of request

Table 2: Deliverables and associated timelines

Deliverables	Delivery date
A report on a complete policy context for climate change adaptation technologies for the Namibian water sector.	1 months after inception of the technical assistance
A report on a complete inventory of climate change adaptation projects for the water sector and international water plans, together with an analysis of lessons learned from these.	2 months after inception of the technical assistance
A comprehensive list of technologies, including their main characteristics and pros and cons	2.5 months after inception of the technical assistance
A report on results from survey to collect information that will serve as input into the technology prioritization workshop for climate change adaptation in Namibia. The questionnaire would have to be developed and distributed widely in Namibia during the first month of the assistance and inputs closing date could be in the second month.	3 months after inception of the technical assistance.
Final report incorporating earlier reports on context and results from the workshop on technology prioritization	6 months after inception of request.
Technology brief on the prioritized water scarcity technologies	7 months after inception of request

2.2 Expertise required

The response team will require the following expertise to implement the project

- Knowledge of climate change adaptation technologies for the water sector;
- Policy review techniques;
- Knowledge of MCA as a tool for prioritizing technologies; and
- Workshop facilitation.
- Financing and technology service provision in the water sector

2.3 Main partners

The list of partners as identified in the original request for technical assistance is as follows. The list of stakeholders involved will be further developed as part of the technical assistance

Stakeholder	Roles in the response
Ministry of Environment and Tourism	National coordination with NOUs and line ministries (Ministry of Environment, Energy and Industry)
Line ministries (like Ministry of Agriculture, Water and Forestry, etc.)	Participating on provide technical expert on identifying water flow modeling, engineering guidance on earth dam construction (design of pilot demonstration)
Academia	Technical research based related support
NGO's and CBO's	Communities mobilization and outreach
Regional Councils	Facilitate the provision of required extension services within their personnel.
Traditional authorities	Provide traditional expert knowledge on water flow history, and catchment data Allocate land for projects sites
Private sectors	Solicit of additional funds, and still provide technical expert as well technological capital resources
City of Windhoek	Technical research based related support
Regional municipalities/Town Councils	Technical research based related support
NAMWATER	Provide expert knowledge on water flow history, and catchment data

2.4 Synergies

The assistance directly addresses the need for the development/identification of water harvesting technologies as outlined in the National Climate Change Strategy and Action Plan for Namibia. The strategy aims to address and plan for action against climate change, particularly through adaptation.

2.5 Timeline

Timelines of CTCN technical assistance are outlined below. In total, the CTCN envisages that the technical assistance will take a maximum of six months to perform the technology prioritization.

Table 2: Gantt chart illustrating the technical assistance to be rendered by CTCN

Activity	Timeframe						
	M1	M2	M3	M4	M5	M6	M7
Activity 1: Contextualization							
Output: Policy and developmental context established							
Sub-activity 1.1							
Sub-activity 1.2							
Activity 2: Face to face stakeholder consultation							
Output: Stakeholder workshop conducted							
Sub-activity 2.1							
Sub-activity 2.2							
Activity 3: Technology prioritization							
Output: List of technology options in order of priority							
Sub-activity 3.1							
Sub-activity 3.2							
Sub-activity 3.3							
Sub-activity 3.4							
Sub-activity 3.5							
Sub-activity 3.6							
Activity 4: Investment and financial aspects							
Output:							
Sub-activity 4.1							
Sub-activity 4.2							
Sub-activity 4.3							
Sub-activity 4.4							

2.6 Indicative budget

An estimated total budget of 110,000-120,000USD will be required to implement the technical assistance.

2.7 Risk identification and mitigation

Risks	Consequence	Probability	Mitigation
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<i>Poor response to the survey that will limit inclusivity</i>	<i>Limited buy in on technology priorities identified for the Namibian Water Master Plan</i>	<i>Medium</i>	<i>Announcement through the media (TV, radio and printed) to create awareness of the process.</i>
<i>Results of the assistance (reports) are not read and not used</i>	<i>Limited buy in of decision makers and general public on the technologies</i>	<i>Medium/high</i>	<i>Tailor the reports and the results of the TA to the specific objective and the specific use that the TA will be used for</i>

2.9 Monitoring and Reporting

Monitoring will be the responsibility of the Climate Technology Manager at CTC, with support from the National Designated Entity of Namibia, to make sure activities are conducted as per timeline and as agreed in this response plan. Each of the deliverables will be submitted to the NDE and the CTCN, after completion of each task as indicated in the logframe in Annex I. The timing of the submission of the reports will be informed by the Gantt chart in subsection 2.5. Monthly calls between the NDE, the request proponent, the response implementer and the CTC, will enable to provide updates on the advancement of the response, to discuss possible difficulties and way forward.

3. Long-term impacts of the assistance

3.1 Expected climate benefits

This technical assistance will support Namibia in increasing its resilience to climate change effects, especially in the water sector. It will help the country better manage water scarcity through the use and deployment of appropriate technologies. This is because the country is one of the driest countries in southern Africa. Climate change predictions have shown that Namibia will face serious water shortages in the near future, as early as 2018.

3.2 Co-benefits

The assistance will benefit the water sector. At this time it has been established during the CP visits that water scarcity is an urgent problem in Namibia. The acceleration of technology transfer to address this problem will be the main benefit of the technical assistance, thus supporting the country's transition to sustainable water management and water security. This is expected to create significant economic, social and environmental benefits, such as increase agricultural productivity, increased income from agriculture, improvements of health and reduction of water related diseases.

3.3. Post-assistance plans and actions

The Namibian government will develop bankable projects that will be funded to upscale the prioritized technologies. The deliverables of the assistance will also be used as a basis by the government to develop a water sector master plans and other related polices.

The table below will serve as a basis for the CTCN, the NDE, the request proponent and the assistance implementer to measure success of CTCN assistance in achieving its expected results and impacts. The exact outcomes triggered by the assistance (number of USD invested, number of technology projects developed, policies developed, etc.) will be measured after the implementation of the assistance.

The numbers in the table below indicate what specific CTCN outcomes and impacts the assistance is expected to trigger, as per the outcomes and impacts listed in Annex 3.

Performance indicators		
Main outputs that will be used by the request proponent and beneficiary (<i>final products that will remain after CTCN assistance</i>)	How these results will be used by request proponents and other stakeholders (<i>how the outputs will be used to ensure creation of outcomes</i>)	Expected outcome in the short term, in effect of the use of the results by the proponents and stakeholders
<p>Overview of policies, plans and projects related to water scarcity, climate change and related technologies</p> <p>Comprehensive list of technologies that can help address water scarcity in the context of climate change</p> <p>Catalogue of prioritized technologies for addressing water scarcity with associated analysis and justification</p>	<p>The policy-makers that have developed the water master plan will use the information contained in this overview</p> <p>Specific projects to address water scarcity will be developed from these technologies</p> <p>The policy-makers developing the water master plan will integrate priorities and actions related to these technologies in the plan</p> <p>The policy-makers developing the water master plan will know what stakeholders to involved in the development and review of the plan to make sure it will lead to success</p>	<p>Expected impacts in the medium term</p> <p>The actions planned in the water sector master plan are implemented and produce concrete results including the increase use of technologies that secure water use in Namibia (2b)</p>
<p>List of key stakeholders related to climate change, water scarcity and technologies</p>	<p>The Ministry of environment and tourism will continue to present the projects concepts and proposal to potential donors</p> <p>The Ministry of environment and tourism will follow-up with all the donors that expressed interest in funding deployment of these technologies</p>	<p>Expected impacts in the long term, related to climate change goals</p> <p>Increase access to safe water</p> <p>Increase availability of water for agriculture</p> <p>Increase productivity in agriculture</p> <p>Increase incomes of farmers</p> <p>Improvement of climate vulnerability index (goal 2, 6, 13 and 16)</p>
<p>Project concepts for deploying the prioritized technologies</p> <p>A number of donors and investors interested in funding deployment of technologies prioritized are identified</p>	<p>Projects related to water technologies are implemented and funded by donors and investors (outcome 1k, 1l)</p>	<p>Technologies that contribute to address water scarcity are deployed in Namibia (2b, 2c, 2f)</p>

4. Formal agreement and signatures

National Designated Entity

Name: Jonathan Mutai Kamau

Title:

Date: 18-08-2015

Signature: 

CTCN Director

Name:

Title:

Date:

Signature: 

Annex 1: Logframe

Activity	Description of sub-activities conducted by the CTCN	Deliverables	Main result of activity (output)	Objectively Verifiable Indicator	Responsible person/organization
Contextualization	1.1 Conduct a complete review of policies, national development plans, sector projects on water sector adaptation in Namibia	A complete review of policies, plans and projects	An overview of policies, plans and projects related to climate change and water scarcity in Namibia is available to the government	Report outlining the review	CTCN CP, NDE
	1.2 Identify technologies that have already been transferred into Namibia (both internationally and domestically)	A complete analysis of current state of technology transfer in the Namibian water sector climate change adaptation efforts.	A comprehensive list of technologies to address water scarcity and related analysis is available to the government	Cumulative report that will include current climate technology transfer activities (building on Report in 1.1)	CTCN CP, NDE
	1.2 Conduct a global review of water sector master plans.	Lessons learnt from other efforts in developing water sector master plans.	A review of water sector master plans and equivalent is available to government	Cumulative report that will include lessons from other countries on water master plans.	CTCN CP, NDE

Activity	Description of sub-activities conducted by the CTCN	Deliverables	Main result of activity (output)	Objectively Verifiable Indicator	Responsible person/organization
	1.3 Conduct survey for purposes of wider data collection on criteria to be used in the technology prioritization.	Preliminary list of criteria to be used for technology prioritization.	A list of criteria for prioritizing technology is available to government	Cumulative report that will include a preliminary list of criteria to be used in the technology prioritization process.	CTCN CP, NDE
Face to face stakeholder consultation	2.1 Identify workshop participants	List of confirmed workshop participants.	A list of relevant stakeholders for water scarcity technologies is available to government	List of confirmed workshop participants	NDE, CTCN CP
	2.2 Prepare for workshop	Agenda and confirmed dates		Workshop minutes	CTCN CP, NDE
Technology prioritization	3.1 Establish decision context based on Activity 1.	Decision context developed in workshop context	A overview of Namibia context related to climate change, water scarcity and technologies is available to all selected stakeholders	Decision context documented in workshop minutes	CTCN CP, workshop facilitator

Activity	Description of sub-activities conducted by the CTCN	Deliverables	Main result of activity (output)	Objectively Verifiable Indicator	Responsible person/organization
	3.2 Presentation on more information about water sector climate change adaptation technologies.	Presentation on more information about technologies		Workshop minutes reflecting presentation on technologies	CTCN CP
	3.3 Identify criteria	List of criteria for assessing the technologies		Minutes indicating how the list of criteria was arrived at.	CTCN CP, workshop facilitator
	3.4 Assign weights and scores and conduct a sensitivity analysis based on discussions.	List of weights and scores for the technologies. Results and discussion outcomes of the sensitivity analysis.	A list of technologies prioritized and available to government and other stakeholders	Minutes reflecting how the scores were arrived at and the results of the sensitivity analysis.	CTCN CP, workshop facilitator.
Investment and financial aspects	4.1 Development of catalogue of technologies	Prioritized list of water scarcity technologies	A catalogue presenting the list of prioritized technologies is available to government and stakeholders.	Catalogue of technologies	NDE and CTCN CP

Activity	Description of sub-activities conducted by the CTCN	Deliverables	Main result of activity (output)	Objectively Verifiable Indicator	Responsible person/organization
			Dissemination of the catalogues to stakeholders within Namibia.		
	4.2 Establish linkages with investors and donors,	Investments or donor funding identified and facilitated	Materials to convince donors and present technologies/projects are available to government and stakeholders	Number of potential donor agreements	NDE, CTCN CP
	4.2 Develop project concepts for prioritized technologies	Project concept notes	Investors and donors are identified for further follow-up by	Number of concept notes	NDE, CTCN CP

Annex 2: Expected Outcomes and Impacts that CTCN Assistance will contribute to

List of potential REP outcomes

- 1a Climate technologies adapted to national context are identified and prioritized to enable their deployment and/or transfer in the requesting countries
- 1b New national Technology Needs Assessment (TNA) and Technology Action Plan (TAP) as a result of the response
- 1c Progress made against mitigation objectives (i.e. energy and carbon intensity reduction) as a result of the response
- 1d Progress made against adaptation or resilience objectives (e.g. climate vulnerability index improvement) as a result of the response
- 1e New mitigation or adaptation technology projects/initiatives implemented as a result of the response
- 1f New or strengthened policies/ laws developed, approved and enacted as a result of the response
- 1g New policies/laws where climate change was mainstreamed as a result of the response
- 1h Country integrating climate change mitigation and/or adaptation issues into its planning and policies as a result of the response
- 1i New or strengthened Public-Private Partnerships (PPP) created directly as a result of the response
- 1j New or strengthened twinning arrangement created as a result of the response
- 1k Capacities to access and attract public and private finance increase to enable financing of technology deployment
- 1l Post-response intervention funding attributable to the response.
- 1m Framework and analysis of local production developed to enable deployment of national production of climate technologies

List of potential REP impacts

- 2a Capacity of developing country Parties to identify Environmentally Sound Technology (EST) needs increased through inter alia enhanced development and implementation of national technology plans for low emission and climate-resilient development
- 2b Capacity of developing country Parties to prepare and implement EST projects and/ or strategies to support action on low emission and climate-resilient development increased
- 2c Enhanced deployment and diffusion of ESTs and associated developed and developing country knowledge/expertise in developing country Parties
- 2d Enhanced endogenous low emission and climate-resilient development capabilities/capacities on ESTs in developing country Parties, including through cooperative research, development and demonstration programmes within and between developed and developing country Parties

- 2f Increased public and private sector investment in EST development, deployment, diffusion and transfer for developing country Parties

management in developing country Parties

2h Strengthened National Systems of Innovation (NSI) and technology innovation centres in developing country Parties.

Sustainable Development Goals²

- Goal 1. End poverty in all its forms everywhere
- Goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
- Goal 3. Ensure healthy lives and promote well-being for all at all ages
- Goal 4. Ensure inclusive and equitable quality education and promote life-long learning opportunities for all
- Goal 5. Achieve gender equality and empower all women and girls
- Goal 6. Ensure availability and sustainable management of water and sanitation for all
- Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all **and sustainable energy** services for all in developing countries, particularly LDCs and SIDS
- Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Goal 10. Reduce inequality within and among countries
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12. Ensure sustainable consumption and production patterns
- Goal 13. Take urgent action to combat climate change and its impacts
- Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development Finance

² <https://sustainabledevelopment.un.org/sdgsproposal> (NOTE: each SDG is composed of a number of targets that may be used to provide better definition of its scope and extent).