



United Nations Development Programme

Country: Eritrea

Project Title: STRENGTHENING CAPACITY OF THE WATER RESOURCES DEPARTMENT TO PLAN, DEVELOP, MONITOR AND SUSTAINABLY UTILIZE THE WATER RESOURCES

Expected CP Outcome(s): By the end of 2012 access to safe water supply improved, and national capacity to manage water resources strengthened.

Expected Output(s): Capacity of the MoLWE to properly undertake its services in sustainable development, management and protection of water resources strengthened.

Implementing Partner: Ministry of Land Water and Environment (Department of Water)

Responsible Parties: Ministry of Land Water and Environment (Department of Water), Ministry of Finance and UNDP

Brief Description

Eritrea, being located in the arid and semi-arid region of Africa, is not adequately endowed with natural resources including water resources. Besides, the country has been subject to recurrent droughts, thus exacerbating the vulnerability of the water resource base to meet national demands. Limitations in human and institutional capacities to plan, develop, and manage the water resources in the IWRM plan have been identified among the key bottlenecks contributing to the mismanagement and inefficient use of water resources. The envisaged project will therefore partly address those challenges through transforming staff capacity and better equipping the Department of Water (DOW) with necessary geophysics, hydrological and hydromet and water quality testing equipment, thus enhancing the knowledge base of existing ground/surface water resources, data acquisition and information management systems and regularly monitoring water quality to facilitate the delivery of efficient and sustainable water resource management practices.

Programme Period:	July 2011- December 2012	2012 AWP budget:	<u>USD 1,706,210</u>
Key Result Area (Strategic Plan):	frameworks of strategies for sustainable development	Total resources required	<u>USD 1,706,210</u>
Atlas Award ID:	<u>00062488</u>	Total allocated resources:	<u>USD 1,706,210</u>
Start date:	<u>October 2011</u>	• Regular	<u>USD 1,706,210</u>
End Date	<u>December 2012</u>	• Other:	-
		• Unfunded budget:	-

Agreed by (Coordinating Partner):

Ministry of Finance

Agreed by (Implementing Partner):

Ministry of Land, Water and Environment

Agreed by UNDP:

I. Executive Summary

Eritrea as part of the arid and semi-arid Sahelian region of Africa is not adequately endowed with water resources. Its rainfall patterns are generally low in extent and erratic in nature. Besides, the country has been also prone to cyclic/recurrent droughts affecting the water resource bases of the country. On top of the prevailing natural obstructions, existing water use and management practices are not efficient often characterized by poor institutional and sectoral capacity, inadequate societal awareness, uncoordinated land use systems, etc.

Various situational analyses investigations recognize the prevalence of huge human and institutional capacity gaps and the lack of systemic comprehensive planning approaches as major contributors to the mismanagement of water resources. Further investigations on capacity issues have also documented challenges including: inadequate coverage and incomplete reading of hydro meteorological stations; non standardized and fragmented data collection system; inadequate data on surface water related information; absence of groundwater monitoring in respect to depletion and quality; insufficient knowledge about country's water resources potential (Surface and ground water potential); weakness in institutional set-up at all levels; inadequate financial resources; Lack of Proper Resources Assessment, Planning, Development and Management strategies, etc.

A small laboratory exists in the department to provide key services such as: monitoring domestic water quality, controlling water quality degradation from mining as well as agricultural and industrial uses and conducting water quality tests for multi-use purposes by carrying out basic bacteriological (fecal and total coliforms bacteria) and chemical (water hardness, salinity, manganese, iron, chloride, nitrate, ammonia and fluoride etc.) tests. The laboratory however lacks the necessary equipment and adequate personnel capacity to undertake analyses of toxic metals, predominantly arsenic, chromium, copper, lead, mercury, *etc.* and other basic supplies.

As outlined under the list of the national IWRM plan priorities, the envisaged 'Capacity Building Project' will address some of the key human and institutional capacity limitations of the Water Resources Department thus improve the DOW's capacity to plan, develop, monitor and sustainably manage the water resources. The project will contribute in transforming the human and institutional capacities of the Department to enhance its knowledge base on existing water resources. At the same time, with the existing low level of quality assurance facilities, rapid urbanization, discharge of hazardous wastes and fast growing population, efforts will be made to upgrade the DOW's laboratory to ensure safe water supply to the general public at national and local levels. In summary, under the broader objective of capacity development therefore, the project will deliver the intended results under the three outcomes of: (i.) Knowledge base of existing water resources improved and efficiency, effectiveness and sustainable water resources management fostered; (ii.) National capacity to collect, store, process, monitor and disseminate hydro meteorological and hydrological information strengthened; and (iii.) National capacity to test hazardous pollutants and to ensure sector based safe water quality is enhanced.

II. Situational Analyses

Eritrea, being located in the arid and semi-arid region of Africa, is not endowed with natural resources including water. The rainfall is very low in amount (mean annual rainfall in the highlands is in the range of 400-500 mm, and in the arid lowlands below 300mm) and erratic in nature. Furthermore being part of Sahelian Africa it has been the victim of recurrent and devastating droughts. Water deficiency is therefore a limiting factor to agricultural, domestic, and industrial and other development programmes.

Inefficient use and mismanagement of water resource is an overriding problem, attributed to a number of interrelated factors such as societal awareness, low national and household economic growth, poor institutional and sectoral capacity uncoordinated land use systems etc. Situational analyses investigations carried out during the preparation of the Integrated Water Resources Management (IWRM) Plan reveals huge human and institutional capacity gap at all levels is hampering effective management of water resources.

Despite Eritrea's heavy reliance on surface and ground water resources for most socioeconomic sectors, knowledge base of water resources is limited to serve as inputs for sustainable management of the water resources. Apart from the 1998 limited scope sector study on 'National Water Resources and Irrigation potential Project' no large scale water resources potential related assessment has ever been undertaken at a national level. Besides the lack of full information on ground water and surface water potentials, the risk of mismanagement is further magnified with the lack of any institutionalized regular quantitative/qualitative monitoring system in place.

Noting Eritrea's complex topographic features often categorized into 6 agro-ecological zones and characterized by fragmented micro-climates, the country lacks a truly (spatially and temporally) representative hydrological and hydro-metrological data acquiring facilities and institutionalized system set ups. As per the 1991/1992 studies commissioned by DOW conducted, about 25 potential meteorological sites were identified but only about 28 % of these station are installed. With emphasis given more in creating access to safe water supply to communities and financial limitations only about 32% of the 60 potential hydrological sites are yet installed. Nonetheless, due to lack of sites' follow up and systemic monitoring schemes, more than 90% of the metrological and hydrological stations are mal-functional, either out of order or need upgrading, maintenance and calibration.

The DOW has systematically identified a range of capacity deficiency related challenges at systematic and bottom levels as inputs in the crafting the IWRM plan including: inadequate coverage and incomplete reading of hydro metrological stations; obsolete stations; non standardized and fragmented data collection system among different institutions; inadequate data on surface water related information; absence of groundwater monitoring in respect to depletion and quality; inadequate skilled manpower with regard to quality and quantity in both surface and ground water fields; insufficient knowledge about country's water resources potential (Surface and ground water potential); inadequate coordination among stakeholders; weakness in institutional set-up at all levels; inadequate financial resources; insufficient

information in regards to domestic demand and supply both for cities and rural areas; limited data flow and information; no valid data base; no unified meteorological services exist in Eritrea; Lack of Proper Resources Assessment, Planning, Development and Management strategies etc.

Concurrent to the objectives of achieving efficient and sustainable water resources management systems, the DOW is also shouldered with the responsibility of assuring safe and adequate water supply to all citizens in the country. A small laboratory thus exists in the premises of the department providing key services such as: (a.) Monitor domestic water quality (b.) Control water quality degradation from mining, agricultural, industrial and coastal areas; and (c.) Collect water quality data for multi-use national development purposes. In this regard, the laboratory dispenses basic bacteriological (fecal and total coliforms bacteria) and chemical (water hardness, salinity, manganese, iron, chloride, nitrate, nitrite, ammonia and fluoride and sulphate) analyses tests. The laboratory however lacks the necessary equipment and trained personnel capacity to undertake analyses of toxic metals, predominantly arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc etc. discharged from manufacturing processes, mining activities, agro-chemicals and domestic wastes. For the same reason, soil and rock mechanics analyses essential tasks in the planning of water development programme are also missing. The fact that the laboratory rooms was not originally designed for the purpose, sanitary and drainage problems are in-built challenges of the building; besides, difficulties to set up a controlled experimental room parameters (temperature/solar radiation) and unavoidable escapes of dusts from outside environment deters possibilities of carrying out sophisticated tests requiring high degree of accuracy and precisions.

III. UNDP Water Related Support to Eritrea

In 1995, UNDP formulated a project to support the Department of Water Resources with the overall objective of developing a multi-year rural water supply and sanitation programme. The project contributed to the strengthening of the WRD national capacity in research, water resource assessment (data acquisition, management and analysis) and programme planning.

UNDP, in partnership with the Government and other development partners, has been playing an important role in supporting water supply and sanitation initiatives as an integral component of its programme in the areas of Crisis Prevention and Recovery, Environment and Sustainable Development and Poverty reduction and Food Security. For example, it has provided substantive support in water supply and sanitation in three of the seven administrative regions of the country, including Debub, Gash Barka, and Southern Red Sea for IDPs, returnees and expellees as a result of the Eritrea-Ethiopia border conflict. Those programmes are substantiated by construction of micro-dams, solar-based borehole systems, recharging water supply scheme, earth dam-based and downstream hand dug well with solar system, rock catchments, water tanks and public fountains, hand pumps, earthen micro-dams, underground water cisterns, WASH facilities, including pit latrines and PHAST training. Under an earlier UNDP recovery programme (PoWER), support was given in the procurement of equipment for newly installed Hydrological stations. The benefits from these initiatives have been enormous, in the

well-being and livelihoods of the targeted population and communities have been greatly improved.

Under the guidance of the MLWE, UNDP has facilitated implementation of various climate change vulnerability and adaptation socio-economic assessments of important sectors including water resources, coastal environment, agriculture, and human health, under the scopes of Initial National Communications, national Adaptation Programme of Action (NAPA) and the Second National Communications to UNFCCC projects. To this end also trained the DOW staffs on Vulnerability & Adaptation techniques for water resources, and running associated software such as Water Evaluation and Assessment Planning (WEAP). Noting the high vulnerability of the water resources, UNDP in partnership with the MLWE also recently succeeded in designing and securing funds for two water resources-based climate change adaptation projects in the Anseba Region: i.) Integrating Climate change Risk Management in water and livestock management in Kerkebet area and ii.) Climate Change Adaptation Programme in Water and Agriculture in Anseba Region; aimed at enriching groundwater to secure adequate water supply, through construction of micro dams, subsurface dams, and other re-charge mechanism infrastructures.

Likewise, through its Poverty Reduction and MDGs Achievement Programme and in collaboration with UNCDF, a series of water resource based development interventions have since mid 2002 been carried out in Anseba putting poverty reduction as the main thrust. Under this programme, more than 22 hand and motor pump driven wells developed with special emphasis given to remotely located communities. Moreover, more than 45 micro-dams, subsurface dams, ponds, gabions, river diversions have been constructed in different villages with multi-purpose use, for human and animal consumption and irrigation. Overall, these projects are playing important role in improving the lives of the beneficiary communities by expanding access to safe water supply as well as generating income and promoting food security with higher impacts on the nutrition and health status of the population. As way forward to secure sustainability and efficient use of micro-dams, UNDP has been promoting catchment/watershed treatments works through soil and water conservation practices (terracing and check damming), as core elements of all water harvesting related interventions.

Central to its core specialization, UNDP also has been supporting an array of capacity development projects under the umbrella of enhancing National Capacity Development for Attaining MDGs, across different sectors including: establishing a national database; capacity building of the Ministry of National Development to strengthen local development planning processes; strengthening Capacities to ensure effective delivery of services such as in Promotion and administration of Justice, Civil Service Administration, Ministry of Foreign Affairs, and the Eritrean Institute of Management. Improvement in human and institutional capacities of the different institutions thus have brought tangible changes in practicing sound codes of conduct in work places, efficiency of work flows, systemic and analytic way of information management and dissemination at different levels.

IV. Strategy

In line with the core mandates of the DOW and as steward of the water resources sector, the need for strong sector governance accompanied by adequately institutionalized legal and administrative frameworks, and the establishment of an adequate and cutting-edge capacity to plan, develop and sustainably manage its resources is imperative.

This project translates the new (2011) cooperation framework agreement signed between the GSE and the UN in Eritrea into action that identifies provision of safe water supply among the key national development priorities. It complies with existing national development policies and strategies in developing the water sector, as stipulated under the IWRM (2009), Eritrea's Water Proclamation 162/2010, Rural Sanitation Policy and Strategy Directions for Eritrea (2007).

As outlined under the list of the national IWRM plan priorities, the envisaged 'Capacity Building Project' will address some of the key human and institutional capacity limitations of the Water Resources Department to tackle factors hampering the country from advancing on sustainable water resources management practices. To this effect, the project will systematically work to harness knowledge base of the DOW by leveraging the department's capacity to carry out ground water and surface water investigations in essential water basins and regularly monitor the status and trends of the potential reserves against demand and supply. In return, serves as scientifically supported reliable information for water resource planners and decision makers across different sectors.

Implementation of the capacity development support will therefore be facilitated through equipping the DOW with survey related instruments such Geophysics equipment that can be used for ground water assessment and monitoring purposes. At the same time, efforts will also be made to strengthen hydro-met works by expanding hydrological and metrological data coverage across different basins to meet the hydrological and meteorological data collection and assessment needs of Eritrea. In light of the observed un-standardized, fragmented and discontinued data handling and information management problems, the project will also facilitate the upgrading of the existing narrow-range Local Area Network (LAN) to wider network connectivity within the DOW department and at national and regional levels.

UNDP as the main spearheading agency in the provision of capacity development within the frameworks of national ownership in developing national and local capacities, the project will enjoy UNDP-CO's accumulated experience and technical backstopping skills gained over years as necessary. Besides, under the overarching framework of UNDP's key development drivers, the project will capitalize on South-South Cooperation to draw experts to train nationals in the different themes of the project sub-components. Moreover, putting self-sufficiency in capacity ownership as masterpiece of ensuring sustainable water resources management, the project will also be linked to other ongoing micro-dam based safe water supply and ground water development programmes currently under implementation in the different regions.

V. Project Description

Objective: The overall objective of the project will be to enhance to the capacity of the Water Resources Department Capacity to plan, develop and sustainably manage the water resources of the country, and its ability to characterize and assure water quality for multi-use purposes.

Outcome 1: Knowledge base of existing water resource improved and efficiency, effectiveness and sustainable water resource management fostered:

Under outcome 1, the project will contribute to enhancing the knowledge base of the Department of Water on available ground/surface water resources by upgrading its human and institutional capacities to carry out necessary resource base related investigations and researches along key water basins through out the country. To this effect, the Department of Water resources will be equipped with useful scientific geophysics equipment to conduct quantitative and qualitative assessments of ground water reserves during resource planning and monitoring activities. In addition, necessary geo-explorative instruments such as GPS, GIS and satellite images of high resolution will also be acquired to substitute the existing obsolete equipment, with more efficient and cutting edge technologies. Along with the equipping activities, the project will also impart experts (national/international) to train the DOW staff at national and regional levels, on the installation, operationalization and basic maintenance of the scientific equipment.

Output 1.1: The capacity of the Department of Water enhanced (staff adequately trained and necessary equipment provided) to augment, update and prepare new hydrological maps and conduct geophysical investigations in key water basins.

Outcome 2: National capacity to collect, store, process, monitor and disseminate hydro meteorological and hydrological information strengthened.

Despite Eritrea's location in the semi-arid Sahelian region of the Sub-Saharan Africa often characterized by regimes of high climate variability, existing hydro-metrological data collection equipment is insufficient to spatially represent the diversified agro-ecological zones and pockets of fragmented microclimates. In sequel, the intervention will realize the installment of new/rehabilitation of XX-Class hydromet stations in areas of critical significance with optimal temporal and spatial coverage, as would be identified by the DOW (and if necessary in consultation with the National Metrological Authority the Regional Administration Offices). This will lead to improving the availability of quantitative/qualitative hydro-metrological data that would be valuable for water resources management. To systematize the non standardized and fragmented data collection system and the lack of a unified information management scheme, a national level water resources information management system will be developed, interlinked through Wide Area Networking (WAN) and connected to central integrated database full capacity to store, analyze hydro-metrological data and disseminate ready to use information to different sector ministries.

Output 2.1: Operational, monitoring, coordination and decision making capacity of the DOW enhanced by developing efficient water resource information management system & networking.

Output 2.2: Coverage and status of stream gauging stations for major drainage basins of the country improved.

Output 2.3: Coverage and status of hydro-meteorological stations of the country expanded and improved.

Outcome 3: National capacity to test hazardous pollutants and to ensure sector based safe water quality is enhanced.

As part of the effort to ensure safe water supply and minimize the risk of contamination by water-borne diseases, the DOW's capacity to perform a competent water quality assurance functions will be strengthened. On top of the limited rudimentary bacteriological (fecal/coliforms) and chemical (common elements) tests being supported, the envisaged capacity building project will equip the Department with Atomic Absorption spectrometer to enable it to conduct tests of toxic heavy metals which are common in wastes of industrial and mining sectors and polluting water points. In addition, necessary equipment and supplies will also be supplemented to carry out efficient soil and sediment analyses, applicable in feasibility studies, Environmental Impact Assessment (EIA) exercises and water quality monitoring activities. Noting the staffing of the laboratory unit by new graduates of less practical experiences, international expertise will be consulted through South-South Cooperation to provide short term on the job trainings on the operationalization of new technologies, and assist in the preparation of step-by-step laboratory guide manuals.

Output 3.1: Regulatory instruments for wastewater and solid waste discharge developed, and capacity to carry out waste water quality testing and soil analysis improved.

Outcome 4: Pre-feasibility assessment study to establish a national water technology institute conducted.

In light of the limited (quality/quantity) human resources availability and the huge national demand for qualified experts in hydrology and management of water resources in the country, the need for more trained personnel is imperative, and the project will assist the WRD to carry out pre-feasibility assessment study to establish a water resources technology institute that will enable to train young water scientists in mass.

Output 4.1: Pre-feasibility assessment conducted and report for decision making prepared.

VI. Legal Basis of Cooperation:

This project is anchored on the new cooperation framework agreement entered between the Government of the State of Eritrea (GSE) and the United Nations in Eritrea, signed in 2011. It is fully aligned to the areas of national development priorities identified by both parties, and is abided by the terms and conditions of the cooperation agreement, implementation not to extend beyond 31 December 2012.

This programme document shall be the instrument referred to, as such in the Agreement between the United Nations and the Government of Eritrea, signed on 11 June 1994. The programme shall be implemented in accordance with the provision of this agreement, and in conformity with the general terms and conditions, applicable to UNDP assistance programmes, signed by the parties on 11 June 1994.

VII. Project Results and Resource Framework

Program title	Water Supply and Sanitation Program			
UNCT outcome	Sustainable Development enhanced through integrated water resources management			
Sector Outcome	Sustained water supply and sanitation coverage to foster public health, human dignity, socio-economic development & environmental protection; (Alignment to MDG target: Proportion of people without sustainable access to safe drinking water and basic sanitation halved by 2015, MDG 7).			
Program outcomes	<ul style="list-style-type: none"> The capacity of the MoLWE strengthened to deliver water resources related services and protection of the environment by 2012 Water supply and sanitation coverage improved by 2012 in targeted locations (villages and communities). 			
Program outcome indicators	<ul style="list-style-type: none"> Government capacity enhanced to ensure sustainable supply of adequate and good water quality as well improved sanitation coverage % increase in sustainable safe water supply and sanitation coverage in targeted locations (villages and communities) 			
Sector Outcome: Sustained water supply and sanitation coverage to foster public health, human dignity, socio-economic development & environmental protection; Alignment to MDG target: Proportion of people without sustainable access to safe drinking water and basic sanitation halved by 2015 (MDG 7).				
outcomes	Programme outputs	Output indicators, baselines and targets	Responsible party	Indicative Resources
Outcome 1: Knowledge base of existing water resource improved and efficiency, effectiveness and sustainable water resource management fostered.	<p>1.1 The capacity of the Department of Water enhanced (staff adequately trained and necessary equipment provided) to prepare hydrological maps and conduct geophysical investigations in key water basins strengthened.</p> <p>Activities:</p> <p>1.1.1 Enhance capacity of the DoW and procure the necessary geophysics, remote sensing (Sat Images), topographic surveying (Total Station), and GIS associated equipment to facilitate preparation of hydrological maps</p> <p>1.1.2 Conduct training needs assessment and provide short term trainings on the use of equipment and survey techniques to DoW staffs at national and regional levels</p> <p>1.1.3 Initiate hydrologic/geophysics surveys to assess Ground Water resources potentials in key water basins</p> <p>1.2.1 Equip the DoW with the necessary planning software such as WEAP and provide expert level long-term water use planning techniques.</p>	<p>Indicators</p> <ul style="list-style-type: none"> DOW equipped with necessary hardware and software equipment to properly conduct studies, planning & monitoring, and capacity enhanced <p>Baseline: Only 10% of the existing geophysics equipment functional</p> <p>Target: Ensure the DOW is equipped with 100% functional geophysics equipment and enabled to properly and efficiently carry out its functions</p>	DOW & UNDP	USD618,364

<p>Outcome 2:</p> <p>National capacity to collect, store, process, monitor and disseminate hydro meteorological and hydrological information, strengthened.</p>	<p>2.1 The Department of Water is better equipped and networked to operate an efficient water resources information system.</p> <p>Activities:</p> <p>2.1.1 Conduct functional analysis assessment of the existing Information Management system of the DOW resources to identify gaps for upgrading</p> <p>2.1.2 Install a national-level Wide Area Network (WAN) computer connectivity system with access to the water department offices at regional administrations</p> <p>2.1.3 Design and install customized hydrological/hydro-met databases at central office/regional/sub-regional stations</p> <p>2.1.4 Develop a viable user-friendly hydrological/hydro-met data acquisition formats, data-logging rights and control mechanism and communication protocols</p> <p>2.1.5 Provide orientation to all staff on the WAN System, and specific training on software operating, data logging/processing and communication protocols/procedures.</p> <p>2.1.6 Develop and institutionalize a standard information flow and dissemination management procedure for internal and external information users</p> <p>2.2 Coverage and status of stream gauging stations for major drainage basins of the country improved.</p> <p>Activities:</p> <p>2.2.1 Install hydrological stations including runoff gauge current meter (Depth Integrated Sampling) with remote sensor data loggers in key river basins</p> <p>2.2.2 Develop a manual on the specifications and standards for the installation of different classes of hydrological stations</p> <p>2.2.3 Provide trainings to DoW staffs from central, regional, sub-regional and local stations on the operations and maintenance of hydrological stations, and the exchange of standardized information.</p> <p>2.2.4 Establish, test and operationalize a functional two-way hydrological information exchange mechanism system between the central and field stations</p> <p>2.2.5 Collect, compile, systematically analyze and widely disseminate regular hydrological information reports for internal and cross-sectoral use purposes</p>	<p>Indicator:</p> <p>National database with viable water resources information management system established</p> <p>All key water sector institutions started sharing data and information for efficient water resources management, development and use</p> <p>Baselines:</p> <ul style="list-style-type: none"> - National database lacks necessary information and periodic updating mechanism - No systematically and institutionally coordinated information exchange and networking <p>Targets:</p> <ul style="list-style-type: none"> - A comprehensive and user friendly as well as systematically and periodically update of national database available - Systematically and institutionally coordinated information exchange and networking among pertinent institutions in place and functional <p>Indicator</p> <p>2.2.1.1: Number of additional river gauge stations established</p> <p>Baseline: River gauge stations available (90% not functional)</p> <p>Target: Gauge stations established in all major rivers in the country, and become operational</p>	<p>DOW & UNDP</p> <p>DOW & UNDP</p>	<p>USD610,000</p>
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	<p>2.3 Coverage and status of hydro-meteorological stations of the country improved.</p> <p>Activities:</p> <p>2.3.1 Install First Class hydro-met stations with remote sensor data loggers in key micro-climate representative areas</p> <p>2.3.2 Develop a manual on the specifications and standards for the installation of different classes of/hydro-met stations</p> <p>2.3.3 Provide trainings to DoW staffs from central, regional, sub-regional and local stations on the operations and maintenance of hydro-met stations, and the exchange of standardized information.</p> <p>2.3.4 Establish, test and monitor a functional two-way hydro-met information exchange mechanism system between the central and field stations</p> <p>2.3.5 Collect, compile, systematically analyze and widely disseminate regular hydromet reports for internal and cross-sectoral use purposes</p>	<p>Indicators:</p> <p>2.3.1.1 Existing hydro-met stations and sub-stations maintained, improved and new meteorological stations and sub-stations established and become operational</p> <p>Baseline: 10 meteorological stations & sub-stations are available out of which 10% are operational</p> <p>Target: 5-8 first class meteorological stations & geophysical studies established and become operational.</p> <p>2.3.1.3 A guide for a standardized way of acquiring & installing hydro-met stations available</p> <p>Baseline: A standardized guide for acquiring & installing hydro-met stations lacking</p> <p>Target: A guide for a standardized way of acquiring & installing hydro-met stations available and used</p>	DOW & UNDP	
<p>Outcome 3:</p> <p>National capacity enhanced to provide improved water quality by effectively testing & controlling pollution & contamination</p>	<p>3.1 Regulatory instruments for wastewater and solid waste discharge developed, and capacity to carry out waste water quality testing and soil analysis improved.</p> <p>Activities:</p> <p>3.1.1 Conduct functional analysis of the existing laboratory of the Department of Water Resources to identify gaps for upgrading.</p> <p>3.1.2 Equip the DoW laboratory with equipment to carry out bacteriological, physical and chemical (heavy metals) examinations for water quality test.</p> <p>3.1.3 Train the DoW staff to carry out bacteriological, physical and chemical analyses and operationalize the laboratory.</p> <p>3.1.4 Identify key bacteriological, physical and chemical pollutants in urban/rural water supply points, and develop safe water consumption standards</p> <p>3.1.5 Develop a national wastewater and solid discharge minimizing/treatment strategies for urban/semi-urban and rural areas.</p> <p>3.1.6 Develop and widely disseminate an easily understandable user's guide manual by different management committees on safe standards and polluted water treatments</p>	<p>Indicators:</p> <p>1.2.1. Well equipped water quality testing and soil laboratory available and become fully operational.</p> <p>1.2.2 Waste and waste water quality testing and discharge standards, guidelines and procedures developed and ready for use</p> <p>Baseline:</p> <ul style="list-style-type: none"> - No heavy metals testing equipment/facility exists - Waste & waste water testing and discharge mechanisms/standards not available <p>Targets:</p> <ul style="list-style-type: none"> - Well equipped & standardized national laboratory available - Waste discharge standards available and ready for use 	DOW & UNDP	USD215,000

<p>Outcome 4:</p> <p>Pre-feasibility assessment study to establish a national water technology institute conducted</p>	<p>4.1 Pre-feasibility assessment conducted and report for decision making prepared.</p> <p>4.1.1 WRD staff training on operating and use of Geophysics, Hydro-met and laboratory equipments (to be disbursed in all outputs)</p> <p>4.1.2 Stakeholder consultation workshop to facilitate road map preparation process</p> <p>4.1.3 Recruit National/International expert to draft and coordinate the road map preparation process</p> <p>4.1.4 WRD Senior management tour visit to a national water technology institute</p>			<p>205,000</p>
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VIII. Implementation Arrangement and Coordination

This project will be executed under the NEX implementation modality, between UNDP, the Ministry of Finance, and the Ministry of Land, Water and Environment (in particular the Department of Water). Accordingly, an agreed jointly prepared project document will be signed between UNDP as supporting UN agency and the Ministry of Land Water and Environment as implementing partner; and as a project planning and implementation tool, detailed Annual Work Plans (AWPs) for the periods of 2011 (July - December) and 2012 will be approved between the MLWE and UNDP.

In line with the new Government of the State of Eritrea (GSE)-UNDP Cooperation Framework 2011 – 2012 under the boarder Water Supply and Sanitation Programme, the DOW will be the primary and lead national implementing institution. While majority of the project components are focused in strengthening at the Head Quarters level, the DOW will centrally coordinate implementation of hydrological/hydromet installation in the Regions and Sub regions in collaboration with their counterparts in the regions.

While UNDP finances implementation the envisaged capacity development project from its core resources it will also provide its technical assistance in the facilitation of staff training as deemed necessary. Besides, realizing the substantive procurement components of the project and the unavailability of supplies in local markets, the project will benefit from UNDP's (country office/HQ) procurement channels in the sourcing and purchase of necessary equipment from international markets through competitive bidding in a speedy manner.

Monitoring and Evaluation: As stipulated under the cooperation framework agreement a policy committee (project board) constituted from the UN R/H Coordinator Office and the Ministry of Finance will provide overall implementation guidance and ensure project conformity to national development priorities and policies. The Policy Committee will pursue Annual Progress Review (APR) meeting on yearly bases, to monitor implementation progress and discuss issues that may hinder project implementation.

The Water Sectoral Working Group (composed of MLWE, UNDP and UNICEF) will meet quarterly to review progress made and identify problem and seek guidance from the policy committee if the need arises. As part of the monitoring schemes, while majority of the project activities are focused on equipping the Water Resources Department, installation and operationalization of the hydro-metrological stations in specific sites will also be monitored by a joint UNDP/WRD team through periodic visits as necessary.

Finally, to track best practises and lessons learned project evaluation will be undertaken; taking the short implementation period (1.5 years) of the project however, evaluation will be limited to only one (independent terminal review), towards the end of project implementation. In addition, depending on the level of financial expenditure, the project will also be subject to UNDP's NIM/NGO Audit exercise on yearly bases.

Reporting: The Project Coordination Unit is required to prepare an annual progress report as per UNDP’s Standard Progress Report (SPR) template, also serving as main agenda for the annual project board meeting. Besides, the project management is also required to update on quarterly progress to UNDP and proactively identify and notify potential risks with possible mitigation measures.

Financial reporting is on quarterly bases; upon signature of an agreed AWP, UNDP will disburse advance of funds to the DOW for implementation of planned activities as per the AWP upon request by the WRD. For this purpose, the Fund Authorization and Certification of Expenditures (FACE) form will be utilized as funds requesting and expenditure reporting. It is mandatory that the implementing partner reports project expenditures on quarterly bases to UNDP, accompanied by narrative progress report.

I. Risk Analyses and Management

Main Risks and Impacts	Steps to Mitigate Risks
<ul style="list-style-type: none"> Unavailability of most scientific equipments planned for procurement in local time causing delays in implementation. 	<ul style="list-style-type: none"> The DOW will utilize UNDP’s procurement channels to source and import necessary equipment through competitive bidding from international markets
<ul style="list-style-type: none"> Continued restriction on operations through lack of securing permission on time to travel to project implementation sites. 	<ul style="list-style-type: none"> Maintain open communication with the Ministry of Finance/Ministry of Land, Water and Environment, to travel to project sites for monitoring purposes as stipulated in the Framework Agreement.
<ul style="list-style-type: none"> Time limit given by the GSA to all UN supported projects, to complete before December 2012, means no extension of duration of the project implementation will be allowed 	<ul style="list-style-type: none"> Sound planning activities implementation vis-à-vis the given duration and ensure timeliness of implementation of all activities and provision of inputs

IX. Detailed Total Budget and Work Plan

Strengthening Capacity of the Water Resources Department to plan, develop, monitor and sustainably utilize the water resources							
Atlas Number: 00062488							
Sector Outcome: Sustained water supply and sanitation coverage to foster public health, human dignity, socio-economic development & environmental protection; (Alignment to MDG target: Proportion of people without sustainable access to safe drinking water and basic sanitation halved by 2015, MDG 7).							
Implementing Partners: Ministry of Land Water and Environment (Department of Water) and UNDP							
Outputs	Activity	Atlas Code	Fund code	Est. budget		Responsible Party	Total Budget
				2011	2012		
Outcome 1: Knowledge base of existing water resource improved and efficiency, effectiveness and sustainable water resource management fostered.							
1.1 Equip and train the DOW to enable prepare hydrological and geophysical investigations in key water basins.	Acquisition of Geophysics Accessories and softwares	72100	04000		618,364	DOW & UNDP	618,364
	Sub Total				618,364	DOW & UNDP	618,364
Outcome 2: National capacity to collect, store, process, monitor and disseminate hydro meteorological and hydrological information, strengthened.							
2.1 The Department of Water is better equipped and networked to enhance efficient water resources information system & Networking enhanced.	Functional analysis to establish efficient and networked national hydrological/hydromet Information Management system	71200	04000		400,000	DOW	400,000
	Acquisition and Installation of a national-level Wide Area Network (WAN) computer connectivity system, including hardwares and softwares	72800	04000			DOW & UNDP	
	Design and install customized hydrological/hydro-met databases at central office/regional/sub-regional stations	71300	04000			DOW	
	Develop a viable user-friendly hydrological/hydro-met data acquisition formats, data-logging rights and control mechanism and	71300	04000			DOW	
	Develop and institutionalize information flow and dissemination management procedure for internal and external information users	71300	04000			DOW	
2.2 Coverage and status of stream gauging stations for major	Acquisition and Installation of hydrological stations including runoff gauge current meter (Depth Integrated Sampling) with remote sensor data loggers in key river basins	72100	04000		100,000	DOW & UNDP	100,000
	Develop a manual on the specifications and standards for the installation of different classes of hydrological stations	71200	04000			DOW	

drainage basins of the country improved.	Establish and operationalize a 2-way functional hydrological information exchange mechanism system between central and field stations	71200	04000			DOW	
	Collect, systematically analyze and widely disseminate regular hydrological information reports for internal and cross-sectoral use; (Including monitoring)	71600	04000			DOW	
2.3 Coverage and status of hydro-meteorological stations of the country improved.	Acquisition and installation of First Class hydro-met stations with remote sensor data loggers in key micro-climate representative areas	72100	04000		110,000	DOW & UNDP	110,000
	Develop a manual on the specifications and standards for the installation of different classes of/hydro-met stations	71300	04000				
	Establish, test and monitor a functional two-way hydro-met information exchange mechanism system between the central and field station	71600	04000			DOW	
	Collect, systematically analyze and disseminate regular hydrological status reports for internal and cross-sectoral use purposes (Including monitoring)	71600	04000			DOW & UNDP	
	Sub Total				610,000		610,000
Outcome 3: National capacity enhanced to provide improved water quality by effectively testing & controlling pollution & contamination							
3.1 Regulatory instruments for wastewater and solid waste discharge developed, and capacity to carry out waste water quality testing and soil analysis improved.	Functional analysis of the existing laboratory to identify gaps for upgrading.	71300	04000		10,000	DOW	10,000
	Equip DoW laboratory with equipments to carry out bacteriological, physical and chemical examinations for water quality test.	72100	04000		150,000	DOW & UNDP	170,000
	Develop a national wastewater and solid discharge minimizing/treatment strategies for urban/semi-urban/rural areas.	71300	04000		15,000	DOW	15,000
	Develop and disseminate a user's guide manual to different management committees on safe standards and polluted water treatments	74200	04000		20,000	DOW	20,000
		Sub total			215,000		215,000
Outcome 4: Pre-Feasibility assessment study for the establishment of a National Water technology Institute conducted							
4.1 A road map for the establishment of a new national level water technology institute developed	WRD staff training on operating and use of Geophysics, Hydro-met and laboratory equipments (to be disbursed in all outputs)	71200	04000		85,000	DOW	85,000
	Stakeholder consultation workshop to facilitate road map preparation process	72100	04000		60,000	DOW	60,000
	Recruit National/International expert to draft and coordinate the road map preparation process	71300	04000		40,000	DOW	40,000
	WRD Senior management tour visit to a national water technology institute	71600	04000		20,000	DOW	20,000
	Sub Total		04000		205,000		205,000

Outcome 4: Project Management							
	Project Monitoring	71600	04000		30,000	DOW & UNDP	30,000
	Terminal evaluation	71200	04000		15,000	DOW & UNDP	15,000
	NEX Audit Exercise	74100	04000		3,000	DOW & UNDP	3,000
	Miscellaneous	74500	04000		9846	DOW & UNDP	9,846
	Sub Total				57,846		57,846
				TOTAL		1,706,210	1,706,210

X. 01 October 2011 – 31 December 2012 Work Plan

Outputs	Activity	2011	2012			
		4 th Quarter	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
Outcome 1: Knowledge base of existing water resource improved and efficiency, effectiveness and sustainable water resource management fostered.						
1.1 Equip the DOW and train to enable prepare hydrological maps and conduct geophysical investigations in key water basins.	Acquisition of Geophysics Accessories and softwares					
	Provide short term trainings on the use of Geophysics equipment and survey techniques to DoW staffs at national and regional level					
	Communication and IT equipment					
	Miscellaneous					
Outcome 2: National capacity to collect, store, process, monitor and disseminate hydro meteorological and hydrological information, strengthened.						
2.1 The Department of Water is better equipped and networked to enhance efficient water resources information system & Networking enhanced.	Functional analysis to establish efficient and networked national hydrological/hydromet Information Management system					
	Install a national-level Wide Area Network (WAN) computer connectivity system, including hardwares and softwares					
	Design and install customized hydrological/hydro-met databases at central office/regional/sub-regional stations					
	Develop a viable user-friendly hydrological/hydro-met data acquisition formats, data-logging rights and control mechanism and					
	Train staff on WAN System, and specific training on software operating, data logging/processing and communication protocols and procedures.					
	Develop and institutionalize information flow and dissemination management procedure for internal and external information users					
2.2 Coverage and status of stream gauging stations for major drainage basins of the country improved.	Install hydrological stations including runoff gauge current meter (Depth Integrated Sampling) with remote sensor data loggers in key river basins					
	Develop a manual on the specifications and standards for the installation of different classes of hydrological stations					
	Train DoW staffs from central/regional/sub-regional/local stations on the operation/maintenance of hydrological stations, and exchange of information.					

	Establish and operationalize a 2-way functional hydrological information exchange mechanism system between central and field stations						
	Collect, systematically analyze and widely disseminate regular hydrological information reports for internal and cross-sectoral use; (Including monitoring)						
2.3 Coverage and status of hydro-meteorological stations of the country improved.	Install First Class hydro-met stations with remote sensor data loggers in key micro-climate representative areas						
	Develop a manual on the specifications and standards for the installation of different classes of/hydro-met stations						
	Provide trainings to DoW staffs from on the operations and maintenance of hydro-met stations, and the exchange of standardized information.						
	Establish, test and monitor a functional two-way hydro-met information exchange mechanism system between the central and field station						
	Collect, systematically analyze and disseminate regular hydrological status reports for internal and cross-sectoral use purposes (Including monitoring)						
Outcome 3: National capacity enhanced to provide improved water quality by effectively testing & controlling pollution & contamination							
3.1 Regulatory instruments for wastewater and solid waste discharge developed, and water & waste water quality testing and soil analysis improved.	Functional analysis of the existing laboratory to identify gaps for upgrading.						
	Equip DoW laboratory with equipments to carry out bacteriological, physical and chemical examinations for water quality test.						
	Train the DoW staff to carry out bacteriological, physical and chemical analyses and operationalize the laboratory.						
	Identify key bacteriological and chemical pollutants in urban/rural water supply points, and develop safe water consumption standards						
	Develop a national wastewater and solid discharge minimizing/treatment strategies for urban/semi-urban/rural areas.						
	Develop and disseminate an user's guide manual to different management committees on safe standards and polluted water treatments						
Outcome 4: Project Management							
	Staff Training						
	Project Monitoring						
	Terminal evaluation						
	NEX Audit Exercise						