AIDE-MEMOIRE

Pilot Program for Climate Resilience (PPCR)
First Joint Mission to the Republic of Yemen:
November 14-23, 2009

Section 1: Introduction

1. A World Bank Mission, led by Ms. Dorte Verner (Sr. Economist and Task Team Leader, MNSSD) and consisting of Messrs. Luis F. Constantino, (Sector Manager, MNSSD) Naji Abu Hatim (Sr. Rural Development Specialist, MNSSD), Bekele Debele Negewo (Water Resource Specialist, MNSSD), Garry Charlier (Sr. Operations Officer, MNSSD), Kanta K. Rigaud (Sr. Environmental Specialist, MNSSD), Pierre Rondot (Sr. Sector Economist, MNSSD), Sherif Motawe (Project Officer, IFC), Johanne Holten (JPO, MNSSD), and Gamal Al Harani, (Consultant), visited Yemen from November 14 to 23, 2009. The mission received assistance from Ms. Nabila Al-Mutawakel (Program Assistant), Ms. Nagwan Sharhan (Program Assistant), Mr. Ali Hassan (Program Assistant), Ms. Yousra A. Jassar (Team Assistant/VMC), Ms. Lia Sieghart, (Consultant, MNSSD) and Ms. Cynthia Bleu-Laine (Operations Analyst, MNSSD). On the side of the Government of Yemen (GOY), the mission was led and coordinated by the PPCR technical focal point, the Environmental Protection Authority (EPA), under the leadership of Messrs. Mahmoud Shidiwah (Chairman of EPA), and Anwar Noaman (Head of Climate Change Unit under EPA).

2. The objectives of the mission were to assist Yemen in its efforts to implement a clear process for formulating a Strategic Program for Climate Resilience. The mission reviewed, *inter alia*, progress accounting for climate risks. It also provided a platform for development agencies, the private sector and NGOs to collaborate in supporting the GOY in its creation of an agreed strategic approach and investment program to integrate climate resilience into core national development and key sector strategies and actions.

3. The main activities of the joint mission included:[1]

- Follow-up on actions agreed during the scoping mission in July 2009;
- Taking stock of country-level activities on climate resilience and the identification of gaps based on the review of implemented, in-country studies and investment projects;
- Initial assessments of opportunities to mainstream climate resilience in national and local development policy, planning, regulatory and budgetary processes and in key vulnerable sectors;
- Broad-based consultations with national stakeholders and development partners;
- Identification and outline of implementation arrangements for the activities under Phase I;
- Preparation of a detailed proposal for developing the Strategic Program during Phase I to include, *inter alia*, a work program, timetable, implementation arrangements, roles and responsibilities and budget.

[1] See Appendix 1 for a detailed Terms of Reference for the mission.

4. The mission takes this opportunity to express its sincere appreciation to the Yemeni officials for the collaboration and warm hospitality extended to the mission during its stay in Yemen. The mission especially wishes to thank H.E. Abdulkarim Ismail Al-Arhabi, Deputy Prime Minister for Economic Affairs and Minister of Planning and International Cooperation (MOPIC), H.E. Abdul Rahman Fadel Al-Eryani, Minister of Water and Environment (MWE), and H.E. Hisham Sharaf, Vice-Minister of Planning and International Cooperation. The mission held discussions and meetings with various stakeholders, including the Inter-Ministerial Committee on Climate Change (IMCCC), Ministry of Water and Environment (MWE), Ministry of Planning and International Cooperation (MOPIC), Ministry of Agriculture and Irrigation (MAI), National Water Resource Authority (NWRA), the EPA and other related agencies as well as representatives of various development partners.[2]

Mission program/agenda

5. The mission held a two-day workshop on the impacts of climate change in Djibouti and Yemen on November 15 and 16, 2009 in which both Djibouti and Yemen participated. A large number of participants from line ministries, academia, civil society groups, donor partners and international experts attended the workshop. This workshop was jointly hosted by the EPA, the World Bank, and the United Nations Development Programme (UNDP). The purpose of the workshop was to (i) share the findings of Bank-supported climate change impacts assessments on agriculture and water study in Yemen, and climate risks and adaptation options study in Djibouti; (ii) to share information on UNDP supported climate change initiatives in Yemen, and (iii) to kick-off the Yemen PPCR, which included the discussion of climate change related issues and opportunities for Yemen.[3] The workshop was followed by a half-day stakeholder consultation attended by members of academia, NGOs, corporations, and other civil society groups ,[4] and a half-day donor roundtable with participation from the French Development Agency (AFD), German Development Bank (KfW) (together with the BGR group), the Embassy of the Kingdom of Netherlands (EKN) and UNDP. Both events were co-hosted by UNDP. Other bilateral consultations with donors during the mission included: Department for International Development (DFID), German Technical Cooperation (GTZ), and Japan International Cooperation Agency (JICA). All representatives of the development partners appreciated the involvement of all relevant stakeholders and confirmed their willingness to collaborate and coordinate as much as possible to capitalize on potential synergies existing among the various agency-supported initiatives.

Key findings, agreements and follow-up actions

6. The consultations with stakeholders confirmed that key vulnerable sectors and thematic areas for Yemen capable of being addressed by the PPCR are water, agriculture, coastal zones, and social and human development. Communities are critical for any sustained adaptation to climate change.[5] The consultations enabled stakeholders to determine a list of climate-related issues and response strategies, as well as to address the role of civil society and other development partners in the PPCR process.

7. The GOY faces numerous challenges, but has shown a strong commitment for the PPCR by creating an Inter-Ministerial Committee for Climate Change (IMCCC). Some key challenges faced by the GOY with direct relevance to climate resilience and adaptation include:

- Poverty and population growth (the population is predicted to double by 2050);

[2] See Appendix 2 for a complete list of people encountered during the mission.
[3] See Appendix 3 for a table of the main findings of the workshop.
[4] See Appendix 4 for the main findings from the stakeholder consultation.
[5] See Section 7.

- Food security at the household and national levels. In 2008, 49.9 percent of rural Yemenis were either poor or food insecure;[6]

- Natural resource availability, particularly water and soil. Yemen's freshwater availability has dropped to less than 150 cubic meters (m^3) per capita per year, significantly below the international water poverty line of 1,000 m^3 per capita per year. Additionally, land degradation continues to be a challenge exacerbated by aridity;

- Constraints on fiscal resources. The budget deficit is around 10 percent and the GOY is experiencing significantly diminishing revenues from oil production. The state's oil production is in severe decline, dropping from 450,000 barrels per day in 2003 to 286,000 barrels per day in January 2009. This drop in oil production has been followed by a drop in the price of oil from $140 per barrel to $65 per barrel. Oil wealth, which accounts for approximately 85 percent of the GOY's revenue, is used to assuage the water crisis by subsidizing diesel fuel for pumps that extract water out of deep aquifers;

- Economic development and governance issues;

- Recurrent droughts, floods and other negative implications of climate change and variability.

8. These challenges, combined with weak capacity and limited resources, can adversely affect the PPCR process and its outcomes if they are not addressed up front during the development of the PPCR. Yemen represents a pilot that will showcase the challenges of dealing/addressing climate change in a fragile environment where multiple stresses operate simultaneously. The program will take into consideration the political economy challenges presented by Yemen at the present time. There is a need for high-level political buy-in and significant country leadership. A major step has already been achieved by the GOY's approval of the formation of the IMCCC, and the selection of the EPA as the technical secretariat for the PPCR (see below).

9. The mission presented its preliminary findings to the IMCCC during the Committee's second meeting on November 23, 2009.[7]

10. This Aide Memoire consists of 10 sections and 10 appendices. Section 2 describes the scope and objective of the PPCR. Section 3 describes the context of climate variability and change in Yemen. Section 4 describes ongoing activities related to climate change undertaken by the World Bank and other development partners in cooperation with the GOY and explores the possible synergies of PPCR with ongoing strategic development planning in Yemen, such as the Disaster risk Management Strategy and the Food Security Strategy. Section 5 describes the institutional mechanisms of the PPCR. Section 6 describes the overall framework for the PPCR in Yemen. Section 7 presents the main sectoral findings. Section 8 describes the challenges and needs for targeting and working with local communities in Yemen in climate change adaptation. Section 9 lists potential Phase I activities and Section 10 presents the agreed-upon next steps.

Section 2: Scope and objective of the PPCR

[6] International Food Policy Research Institute (IFPRI); World Bank
[7] See Appendix 11 for minutes from the meeting.

11. Due to its high vulnerability to climate change, Yemen has been invited to participate in the PPCR as one of pilot countries. PPCR is the first program under the Strategic Climate Fund (SCF) of the Climate Investment Funds (CIF). The PPCR aims to provide incentives for scaled-up action and transformational change through pilot projects, which will demonstrate how to integrate climate risk and resilience into core development planning. At the same time, it hopes to complement other ongoing development activities in a given country. The PPCR will be country-led, and will enable pilot countries to transform country-specific plans and investment programs in order to address climate risks and vulnerabilities, building on the National Adaptation Programs of Action (NAPA) and other relevant country studies and strategies. Substantial programmatic resources will then be made available to help fund the newly identified public and private sector investments.

12. Under the PPCR, up to $1.5 million will be allocated for the selected pilot countries for the preparation of the Strategic Program for Climate Resilience (SPCR), and $30-60 million will be made available for implementation of the program in key vulnerable sectors. Approximately half of the funds are available for grant financing and the rest will take the form of a highly concessional loan. Pilot countries will not be obliged to accept concessional loan financing as a condition for receiving grants.

13. The PPCR process is divided into two phases. In Phase I, the SPCR will be developed. The implementation of specific projects/programs that are proposed during Phase I will occur during Phase II. Phase I is expected to last from 3 to 18 months, with the understanding that most countries will choose and be able to achieve the aims of the process within a year from the time of the joint mission. The key activities during Phase I include: (i) initial joint mission to develop a proposal and budget for the SPCR; (ii) tasks related to the development of the SPCR; (iii) second joint mission to review and finalize the SPCR; and (iv) submit the final SPCR with specific investment recommendations as the output of Phase I. This mission constitutes the first part (i) of Phase I, which will embark on the formal process to develop the SPCR.

Section 3: Climate Variability and Change in Yemen

14. The Intergovernmental Panel on Climate Change (IPCC) in its Fourth Assessment Report projects higher rates of warming over East Africa and the Arabian Peninsula than the global average.[8] This finding is based on an ensemble of 21 global climate model (GCM) simulations which also show, on average, increased winter, summer and annual precipitation totals over Yemen. While some sense of agreement is usually achieved in models predicting temperature change, there is no clear consensus on projected changes for Yemen. There is even less accord among the models mapping extreme events. This large uncertainty is presumably related to poorly characterized precipitation processes for East Africa and the Middle East within the present generation of climate models. Even under observed climate conditions, regional climate models such as RegCM3 are known to overestimate rainfall totals in areas of high elevation [9] that characterize most of East Africa and Yemen.

15. In Yemen, the impact of climate change is expected to be particularly acute due to historical patterns of climatic variability, high levels of water scarcity and the country's reliance on climate-vulnerable sectors, such as agriculture. With per capita annual water resources of only 195 m^3, Yemen

[8] Christensen et al (2007a). Regional Climate Projections. "*Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change"*, Solomon, S., Quin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M. and Miller, H.L. (eds.), Cambridge University Press, Cambridge.

[9] Pal, J.S., Giorgi, F., Bi, X. et al. 2007. RegCM3 and RegCNET: Regional climate modeling for the developing world. Bulletin of the American Meteorological Society, 88, 1395-1409.

faces extreme water scarcity. Average annual precipitation in the country is very low, ranging from less than 50 millimeters (mm) in the coastal plains and desert plateau regions to around 800 mm in the mountainous highland region in the west. To make matters worse, the precipitation distribution of Yemen is characterized by seasonally intense and short-lived heavy storms that produce flash floods interspersed with long dry periods leading to widespread drought. On October 25, 2008,[10] a flash flood claimed the lives of more than 100 people and left more than 20,000 people without shelter in the Hadhramout and Al-Maharah governorates. Groundwater is being mined at an alarming rate and depleted at more than four times the recharge rate of major aquifers, including the Sana'a basin aquifer. With additional consequences occurring because of climate change, such as changes in precipitation distribution that affect watershed hydrology, cause increased precipitation intensity and a hotter climate and more frequent drought, water stress is likely to get worse. Consequently, it is imperative to mainstream adaptation measures into the overall development strategy of the country at national, regional, sectoral, and project levels. [11]

16. Based on these findings it is crucial to undertake institutional analyses that urgently implement a climate information system.

Section 4: Climate-related Activities Undertaken in Cooperation with the GOY and Potential Synergies with Other Strategic Development Plans

Potential synergies with activities undertaken by development partners

17. The mission organized a meeting of development partners on November 17, 2009 in order to share information, discuss the scope and objectives of the PPCR and identify opportunities where collaboration and synergies could be elaborated.[12] Bilateral meetings were also held with other development partners. The development partners were invited to discuss their possible involvement in Phase I of the PPCR. All development partners agreed on the urgency of the issue and mentioned water, agriculture and social issues as areas of intervention. The findings from the meetings are incorporated in the findings presented in Section 7.

18. Key development partners are currently involved in climate resilience activities. Brief descriptions of their involvement are below:[13]

- UNDP is an active player in the field of climate related issues in Yemen. It has expressed its interest in continuing to collaborate and support the GOY by preparing and implementing NAPA, a national strategy to combat desertification, an economic diversification project and a sustainable natural resources management (Phases I and II). Given UNDP's comparative advantages in capacity building, working with legal and institutional frameworks and its local presence in Yemen, it offered to support the PPCR by facilitating inter-ministerial coordination, providing training and supporting capacity building of different agencies participating in the implementation of PPCR. UNDP has also indicated that it may be able to mobilize resources of its own to support implementation of some projects. The mission appreciates the close collaboration and cooperation with UNDP in this pilot program, especially given the

[10] Reported on the CNN news website: http://edition.cnn.com/2008/WORLD/meast/10/25/yemen.flooding/index.html

[11] See Appendix 4 for a detailed description of the expected climate change impacts in Yemen.

[12] See Appendix 2 for the list of development partners who participated in the meeting.

[13] See Appendix 6 for a list of climate related activities implemented in Yemen by development partners, including the World Bank

organization's rich experience in implementing GEF's small grants and others that can prove useful during this program.

- Both GTZ and KfW are very active in the water sector in Yemen. GTZ has also supported the 'biodiversity conservation in protected areas' project in Yemen. Both GTZ and KfW have agreed to support the PPCR through their already ongoing water projects, including capacity building and technical assistance in the same sector. GTZ recently (November 2009) signed an agreement with Ministry of Health to establish a department for donor-funded health projects.

- DFID does not have active climate related activities in Yemen. However, given its active role in support of the climate agenda at the global level, including through the PPCR and its support to the GOY in the water sector, it has expressed interest to collaborate with this program. DFID would likely provide feedback based on experience and its country engagement, particularly with regard to prioritization of short- and long-term challenges, regional climate data analysis and Yemen's as a fragile state.

- The Netherlands Climate Assistance Programme (NCAP) has in the past supported a few studies on the impact of climate change on the water sector in Yemen. It also actively supports the GOY's initiatives in the water sector, especially in capacity building and database development and management. NCAP agreed to collaborate with the program in the areas of water resources management and climate- and water-related database development and management.

- The JICA has set aside environmental grant aid to combat climate change. The Agency also supports a number of activities in Yemen that will all be highly affected by climate change, such as support for the enrollment of girls in school, support for rural water supplies, projects to increase food production and community nutrition support. JICA is in the process of establishing an outreach network of selected volunteers to conduct basic nutritional monitoring on the ground. It is possible that climate change monitoring could be as added to JICA's fieldwork in the primary education sector.

Potential synergies with key strategic areas

19. The EPA, supported by UNDP-GEF funding, prepared and produced the NAPA from 2004 – 2008. An extensive consultation process at local, governorate[14] and national levels was undertaken to develop the NAPA, which identifies three main sectors that are vulnerable to climate change: water resources, agriculture and coastal zones. Biodiversity, health and tourism were also identified as being vulnerable to climate change. The NAPA distinguishes eight priority adaptation activities within the three priority sectors and four cross-sectoral priority activities.[15]

20. The PPCR should build on the NAPA, but also seek to build full ownership of the PPCR process through a process of broad-based stakeholder consultations. These could be undertaken through regional clusters covering all governorates (i.e. northern, southern, eastern and western). Such stakeholder consultations should reach out to the full spread of representation.

21. The PPCR process should prioritize its synergy with the Poverty Reduction Strategy Papers (PRSP), the 4th national development plan, the food security strategy, the water sector strategy and other relevant development strategies.

[14] Consultations were undertaken in seven governorates throughout Yemen.
[15] See Appendix 7 for a list of the identified projects in the NAPA.

22. The National Water Sector Strategy and Investment Program (NWSSIP) for 2005 – 2009 and its update for 2009 – 2014 were created to address the three main problems in the water sector: (i) low water resource availability, groundwater overdraft and irrigated agriculture vulnerabilities; (ii) inefficient service, inadequate coverage and high fiscal subsidy of water supply and sanitation in urban areas; and (iii) low coverage and poor sustainability of water supply and sanitation in rural areas. The following interventions were highlighted as a mechanism to achieve the above three main problems in the sector: (i) sector restructuring and institutional development; (ii) decentralized water resources management (e.g. through assistance to NWRA and basin and local-level initiatives); (iii) water resources management and water use efficiency through irrigation improvement; (iv) urban water reform and investment to expand coverage; and (v) rural water and sanitation reform and investment.

23. The GFDRR is currently funding a National Disaster Risk Management (DRM) Strategy for Yemen ($1.2 million for 2008 – 2010) aimed at assessing disaster risks, building capacity and undertaking pilot activities. This includes ongoing risk assessment at local, governorate and national levels, and technical assistance in establishing a post-flood recovery fund for Hadhramout. A capacity-building workshop on Post-Disaster Needs Assessment (PDNA) was held in December 2008.

24. The proposed three-year (2010 – 2013) comprehensive program of support for DRM in Yemen ($10 million) focuses on strengthening Yemen's institutional capacity for disaster risk assessment and risk reduction activities, and on implementing a national civil works program to reduce the risks from flooding. The PPCR and those implementing the National DRM Strategy should coordinate project goals to avoid duplication of efforts and to ensure maximum impact of resources. The PPCR should also actively promote the development of synergies and exchange of lessons learned between the DRM and Climate Change Adaptation divisions.

25. Food Security is a high priority for the GOY, which created a Food Security Council in 2007. Presently the EU is assisting the GOY in the establishment of a Food Security Secretariat to which a series of ad hoc task forces chaired by line Ministries will be attached. The Yemen-EC Country Strategy Paper (CSP) 2007 – 2013 highlights the continued need to support food security measures in Yemen, in line with other development cooperation activities. Recently, €17 million was allocated for the Multi-annual Indicative Programme (MIP) 2007 – 2010, which might be indicating support for a sectoral approach.

26. Food accessibility and availability may be improved through four main actions:

- The National Food Security Strategy will be coordinated and designed under the Ministry of Planning and International Cooperation (MOPIC);
- Linkages between the agriculture and water sector programs will be strengthened;
- Institutions will be strengthened and capacity of the MAI and the MWE will be increased;
- The World Bank and MAI rain-fed agriculture programs will be supported and extended beyond their current five governorates.

Potential synergies with ongoing World Bank climate related activities

27. A number of activities related to climate change in Yemen are undertaken and/or supported by the World Bank. These activities, be they studies or projects, will all contribute to the knowledge base for the PPCR. The table on the following page lists the ongoing climate related activities supported by the World Bank in Yemen.

Sector	Activity				
Climate modeling	Climate Change Scenarios Projections	Climate impacts on water resource management in agriculture and other sectors	Climate impacts on agro-biodiversity	Hadhramout and Al Mahara probabilistic risk assessment	
Agriculture and rural development	Rain-fed areas livestock project	Rural community resilience to climate change	Agro-biodiversity and adaptation project	Costing adaptation through local institutions	Real option cost benefit analysis
Urban development	Integrated urban development project				
Social development	Climate-induced migration and displacement				
Coastal zone management	Yemen integrated coastal zone management project				
Water	Water sector support program				
Disaster risk management	Probabilistic risks assessment study				

Section 5: Institutional Mechanisms of the PPCR

28. The IMCCC was approved by the cabinet on November 10, 2009, indicating a strong political commitment to merge climate resilience into Yemen's overall development program.[16] The first IMCCC meeting was held, with the participation of the World Bank mission, on November 21, 2009. The EPA gave a briefing on its climate change related works to date followed by a presentation of the PPCR. A discussion of the institutional arrangements for of the PPCR in Yemen ensued. The Deputy Prime Minister and Chairman of the IMCCC underlined that the IMCCC needs to be underpinned by a good technical and coordination arrangement mechanism (a secretariat) to ensure necessary discussion of the proposals, recommendations and advice presented to the IMCCC so that the Committee can provide its unreserved support. Both the GOY and World Bank mission indicated that a technical secretariat for the IMCCC should be an immediate priority. In this context, the World Bank, under the auspices of MWE, was invited to present an analysis of four options for the technical secretariat (TS-IMCCC) for the consideration of the IMCCC. During the second meeting of the IMCCCs on November 23, 2009,[17] the Bank presented an analysis of the pros and cons of four different options for the technical secretariat to the IMCCC.[18] Following the presentation of the

[16] See Appendix 8 for a translation of the Cabinet decree on IMCCC.
[17] See Appendix 11 for the minutes of the meeting.
[18] See Appendix 9 for a matrix compiling the pros and cons of the different suggested setups.

alternatives, the IMCCC unanimously decided that the EPA will be responsible for the technical secretariat. Every member of the IMCCC also recognized that the EPA, while having the most experience with climate change, lacks the capacity in its current form to successfully lead the implementation of the PPCR. Therefore, there is a pressing need to support the EPA with essential technical and administrative staff so that it can carry out the expected tasks in a timely manner. At present, the EPA has a total of three fulltime staff working with climate change. Of those, one is seconded from UNDP.

29. The Bank suggested that the IMCCC should be enlarged to include representatives from the Ministries of Education, Public Health and Population and Labour and Social Affairs.

30. The selection of the EPA as the technical secretariat is supported by all donor partners who recognize that this authority has the most experience with climate change. Moreover, all donor partners recognize the limited capacity within the EPA, and EKN, KfW, DFID and UNDP have subsequently indicated their willingness to immediately support the EPA with technical assistance.

Section 6: Overall Framework for the PPCR in Yemen

31. Adaptation initiatives need to be implemented as part of broader set of actions within Yemen's existing development processes, decision cycles and institutional arrangements. Only under special circumstances is stand-alone adaptation appropriate. A "whole of Government approach" should be adopted, meaning that integration should occur at all levels of governance. The process would begin with an institutional assessment followed by an assessment of impact of climate change on the plans, policies and strategies. Special care should be taken to note the interactions between the various sectors and divisions of government, including planning and finance commissions dealing with budgetary decision-making. Capacity building is needed to mainstream climate resilience. At the sectoral level, the process should begin with the designated priority sectors/themes of agriculture, water resources, coastal zones and social sectors. Some key important elements that could form a part of this approach include:

- Climate resilience in national and sectoral policy, planning and budgetary processes. There has been limited attention paid to climate risk concerns in national and sector policy, planning and budgetary processes and in the design of individual projects financed locally or by the Arab Fund in Yemen to date. Few line agencies appear to have explored what climate change could imply for their respective sectors.

- Adaptation to climate change in sub-national policy, planning and budgetary processes. Adaptation has yet to be integrated into provincial policy, planning and budgeting processes. There are limited budget resources to meet even current priority development needs, let alone the cost of adaptation. There is also a limited institutional comprehension of climate risks and a lack of technical capacity to integrate adaptation to climate change into governorate planning processes. There has been no evidence reported of any training organized at the governorate or local council levels to provide such a capacity.

- Mainstreaming and reflecting climate adaptation into the National DPRR. The preparation of the GOY's 4th national development plan is underway and provides a timely way to integrate and mainstream climate resilience into core development planning.

- Decentralized pilots as part of the PPCR. The PPCR may explore the possibility of selecting one or two governorates based on clear agreed criteria (e.g. good governance, good capacity, ongoing programs, etc.) to serve as pilot regions for PPCR investments. The selected areas should achieve multiple objectives closer to

the ground, such as demonstrating climate resilience in agriculture, coastal zone, community and livelihood issues, decentralized capacity, harnessing local communities, women and CSOs.

Section 7: Main Sectoral Findings

32. Using broad-based consultations and relevant literature, the mission found that the following sectors were particularly vulnerable to climate change: water, agriculture, coastal zones, natural resources, infrastructure, human and social development and the private sector. Additionally, given the current risk environment in Yemen, local communities were suggested to be key partners in the adaptation process. The remainder of this section will detail the findings in the seven key sectors.

Water

33. The water sector is one of the most vulnerable sectors in Yemen to climate change impacts. Yemen is already facing extreme water scarcity even without the impacts of climate change. The rapid depletion of water reserves from aquifers is a major threat to the country as a result of three factors: (i) exacerbated problems with aridity due to climate change induced changes to rainfall distribution; (ii) over-extended agriculture; and (iii) rapid growth of urban centers.[19] In large swaths of rural areas, economic prospects and the sustainability of livelihoods are in jeopardy. In some important cities, such as Tai'z, running water is already available only a few hours every other week. In Sana'a and other urban centers, aquifers may be fully exhausted in the next 20 years. It is therefore imperative to appropriately manage water resources in order to improve access to water supply and sanitation, reduce groundwater overdraft and improve the efficiency of irrigation methods.

34. Even though the NAPA identified water resources as one of the most vulnerable sectors to climate change, there has been no integration of climate change or resilience concerns into national water strategies, policies, plans and programs. The water section of the Third Socio-economic Development Plan for Poverty Reduction (DPPR) for 2006 – 2010, the NWSSIP for 2005 – 2009 and the NWSSIP update for 2009 – 2014 do not have direct references to potential impacts of climate change or resilience measures in their plans. Climate change is projected to increase rainfall variability (timing, frequency, and intensity) and bring about major changes in basin hydrology. As a result, some models predict more frequent and intense flooding, similar to the recent floods in Hadhramout and Al-Maharah governorates on October 25, 2008[20] that claimed more than 100 lives and left more than 20,000 people without shelter.

35. While the Yemeni population is well adapted to seasonal variation in precipitation, their adaptive capacity towards unusual water regimes, such as extreme drought and flood, is extremely limited. Further, the MWE and other related agencies have little capacity to effectively manage water basins and irrigation systems due to institutional, technical and financial barriers. The adaptive management capacities of relevant ministries, such as the Ministry of Local Administration (MoLA), Ministry of Interior (MoI) and Ministry of Defense (MoD) are also very weak, resulting in limited Government ability to maintain early warning and disaster preparedness and management tools.

36. Major areas of vulnerability in Yemen's water resources relate to water availability and consumption. Climate change impacts water availability because it dictates the distribution of precipitation and other climatic variables. Those in turn dictate the availability of water resources as a whole. Additionally, climate change impacts water consumption because of temperature increases and higher demand for agricultural, municipal and industrial purposes. Water in Yemen is already scarce

[19] Urban populations are increasing at a rate of 5 percent per year, which is the fastest growth in the MENA Region.
[20] CNN news website @ http://edition.cnn.com/2008/WORLD/meast/10/25/yemen.flooding/index.html

and climate change is likely to exacerbate this challenge. The effects of climate change, such as heavy flooding, will also cause significant damage to infrastructure. As such, rehabilitation and climate proofing of flood control and irrigation infrastructure is crucial.

37. A number of priority issues in the water sector could be addressed by the PPCR by:

- Rehabilitating and/or establishing a systematic network of hydro-meteorological monitoring stations; collating of relevant physiographic, agricultural, social and economic datasets to enhance understanding of the system and decision-making processes in the sector.

- Enhancing the capabilities of relevant institutions to develop and use appropriate tools (hydrological models, DSS and weather forecasting with a long lead time, including seasonal forecasting, early warning system, decision support system) and latest technologies, such as GIS, remote sensing, MIS/DSS, to better understand decision making in the water sector.

- Investing in a public awareness campaign regarding the scarcity of water, its proper use and community water management, for example through water user groups.

- Building institutional and technical capacity in the MWE, including NWRA, NWSA, and GARWSP and sub-national agencies to better integrate climate change concerns into water supply strategies and policies.

- Insuring close cooperation among various agencies with interests in the water sector, including MAI, MWE, NWRA, EPA, NWSA, GARWSP, and CAMA. Currently, there is weak communication and collaboration among these agencies and, as a result, the duplication of activities, the inefficient utilization of resources and inadequate performance is widespread. For example, recent reports highlight the water sector's negative investment environment in which drilling efforts to find groundwater turn out to be unsuccessful more than 40% of the time, causing the loss of both time and investment capital.

- Updating knowledge on different basins to determine safe yields and storage capacities of aquifers and other surface water sources. Much of the assessments in the Yemen water sector refer primarily to the 1995 Water Resources Assessment of Yemen (WRAY). Many factors have since changed: the population has almost doubled, irrigation and agricultural activities have been significantly expanded and the country has seen increased economic development. Consequently, the 1995 WRAY should not be used today for planning and decision-making purposes.

- Investing in ways to reduce water and system loss (i.e. reducing unaccounted for water, eliminating distorted subsidies in the water sector and encouraging the reuse, recycling or desalination of water wherever appropriate.

- Expanding and improving water supply, sanitation services and irrigation sector through private sector participation.

- Implementing integrated water resources management (IWRM) strategies, including employing appropriate on- and off-farm agricultural water management and improving irrigation water productivity, water harvesting, watershed management and artificial recharging. Additionally, spate irrigation will facilitate supplemental irrigation to bridge short and usually devastating dry-spells during the year.

- In view of additional likely challenges resulting from climate change, the PPCR may support studies that will look critically at the role of agriculture (and various agricultural practices) in the nation's economy to potentially determine alternative options as adaptation measures.

- Rehabilitating existing flood protection infrastructure and/or expansion of new flood protection infrastructure to address climate change risks.

- Integrating climate resilience into the design of new infrastructure for irrigation and flood control.

- Using bioengineering-based options to protect embankments and irrigation infrastructure.[21]

Agriculture

38. The agricultural sector provides jobs and income to the vast majority of the rural Yemeni population. Approximately 73 percent of the total population in Yemen lives in rural areas[22] and 40 percent are poor. Rural poverty has increased in the past few years due to increased food prices and the global economic crisis, which adversely affected rural migrant workers. While around 90 percent of rural households are involved in some agriculture or livestock production, only about 60 percent have access to land.[23] Land ownership is highly concentrated – 12 percent of rural households control 80 percent of the land. These same households also have access to water for irrigation. Since the soil quality is deteriorating and water resources are being depleted, climate change and the unpredictable nature of rural life often leads the rural population migrate to urban areas or other countries. Finding employment through migration plays a major role for populations with limited assets. Overall, one-quarter of the adult male population migrates for work, often for more than half of the year, while the rest of the family remains in their village.

39. Subsistence farming is widespread and already under stress due to climate change. The rural extension services are largely absent and increased climate variability contributes to reduced yields. Moreover, the agriculture sector is considered one of the most vulnerable to climate change and variability. The government has inadequate institutional arrangements and insufficient human and financial resources to deal with climate change. There are few if any references to climate change and sustainable agriculture development in key policy and planning documents, and there is no coherent and comprehensive policy framework in place to guide action in the agriculture sector.

40. Climate change already has the following impact on local rural communities: increased water scarcity, lack of upkeep for terraces, which is mainly due to male labor migration, increased food insecurity causing malnutrition, decreased school attendance by children replacing males who have left to find work and increased conflicts between communities fighting over access to water and land.

41. There are a number of priority issues that could be addressed by the PPCR by:

- Making an inventory of existing coping mechanisms developed by local communities in efforts to adapt to climate change. Such a diagnostic should identify the strengths and the weaknesses of those coping mechanisms and adaptation strategies. Suggestions may be offered for means to improve local methods, but non-community

[21] Such options are highly labor-intensive and will provide income to the rural population necessary for household-level adaptation measures.
[22] Rural is defined as any agglomeration of fewer than 5,000 habitants.
[23] Land access is defined as land owned, adding land rented or share-cropped and subtracting land rented to others.

members should make every attempt to build on local knowledge and capacity. It is essential to have community participation in all steps related to planning, decision-making and implementation.

- Raising community awareness on family planning and its potential impact on natural resource management in a context of climate change.

- Capacity building and awareness rising across all departments at the Ministry of Agriculture and sub-national levels is a top priority.

- Mainstreaming the CRM into policy planning. This process can be used as a capacity-building vehicle.

- Strengthening data collection (e.g. agriculture productivity, land use, soil type) methodology and analysis for both planning and research purposes.

- Researching and extending the CRM with regard to productivity and diversification factors affected by climate change (e.g., soil and land use management, water resource use, and vegetable seed varieties).

Coastal zones

42. Discussions on this thematic area emphasized the vulnerability to climate change of natural ecosystems and the coastal zone. During the stakeholder and civil society consultations, there were strong statements relating to the vulnerability of the coastal zone. Key points are summarized below:

- The vulnerability of the coastline was raised by various stakeholders – particularly by representatives from Hodeidah, Hadhramout and Aden. References were made to events and phenomena (storm surges, floods) in recent times and the implications of these events on their livelihoods. Additionally, coastal zone management was confirmed as the top priority in NAPA as previously identified by prior stakeholder consultations. The vulnerability of the fisheries along the Yemeni coast has been documented through the IPCC process, and recent published papers draw attention to Aden as one of top 20 cities vulnerable to a rise in sea level.

- The above paragraph calls for the PPCR to address the coastal zone as a major thematic sector. Various strategies for coastal zone management were raised, including preventative measures, nature-based solutions (use of mangroves), development planning and disaster risk management. There is potential for this sector to combine climate resilience measures with disaster risk management. The contributions and input of fishers, fish cooperatives, government authorities (including the local government, fishing authorities, etc.), the tourism sector, entrepreneurs, local communities, NGOs, the private sector, academia and research organizations should be sought in defining priorities.

- The first and second (ongoing) national communications undertook work regarding the vulnerability of the Hodeida and Aden (ongoing) coastlines and formed an important base for the development of information. The ongoing IDA project on Fisheries Resource Conservation and Management Project and the proposed Climate Resilient Coastal Zone Management Project could also constitute important starting points for designing interventions in this sector.

- There is a need to undertake high-resolution, topographic surveys of Yemen's coastal zone to establish baseline data and to determine those sites that are most vulnerable to projected changes in extreme tidal levels (when combining sea level rise, tidal cycles,

surges and waves). Additionally, tidal gauges located at strategically meaningful locations along Yemen's coast must be installed and maintained and their data disseminated.

Natural resources

43. The issue was not fully explored during these consultations. The importance of biodiversity, particularly agro-biodiversity, was recognized as being critical to food resilience and food security. The importance of traditional knowledge and the role of gender were recognized as target areas for part of a broader resilience strategy. There needs to be a more systematic and focused discussion on this issue with environmental NGOs, EPAs and others during future consultations.

Infrastructure

44. Proper infrastructure is a prerequisite to virtually all forms of poverty reduction, economic development and disaster relief. Even though impacts of climate change such as floods seriously damage infrastructure in Yemen (e.g., main road damages in Al-Mukallah resulting from the October 2008 flood in Hadhramout), climate risk and resilience are missing from infrastructure development plans at both national and sub-national levels. For example, the strategy and policy documents of the Ministry of Public Works and Urban Development, Ministry of Transportation and Ministry of Oil and Minerals do not address climate change and resilience. In some cases, various critical infrastructures are at risk from floods, droughts and local inundation. Integration of climate resilience concerns in infrastructure planning and investments thus requires interventions at multiple levels. The PPCR may support a number of priority interventions, such as:

- Updating policies and strategies of relevant ministries to address the issues of climate resilience and provide scope for interventions.

- Institutional and technical capacity building in relevant ministries to integrate climate risk and resilience in infrastructure design and development.

- Preparation of a climate resilience checklist for infrastructure projects to include protection from both inland flooding and flooding caused by a rise in sea level in coastal areas. For example, guidelines can be prepared to ensure that all road infrastructure projects are assessed for compliance with climate resilience standards in a similar fashion to the current guidelines for environmental assessments.

- Revision of technical specifications and standards to support climate resilient road design; improving road inventories to record road sections at risk from flooding and other hazards.

- Revision of road design guidelines to provide knowledge and emphasis on the use of climate resilient road designs in terms of road levels and capacity of structures; use of water resistant road making materials, including stabilization and recycling of existing road materials; and the use of bio-engineering to reduce erosion in a cost-effective manner.

- Revision of the currently accepted "lowest-cost" approach to road designs to approaches that recognize and select the most appropriate design (in recognition that a small increase in construction cost by selecting more resilient materials will provide climate resilient infrastructure and a long-term reduction in cost).

- Supporting the review and redesign of planned and completed infrastructure projects as necessary.

Human and social development

45. Climate change may impact most Yemenis, but the poorest and most vulnerable will suffer the most. The human and social implications of climate change are already being felt in Yemen and the poorest are those most affected by those changes. For example, girls are already being pulled out of schools or not being allowed to attend because they need to fetch water and firewood for the household. Since both resources are becoming scarcer, they have to walk further and further in order to collect water and firewood. These girls are replacing men and boys who have migrated to find a source of income. The temperature increase is having health impacts, shown in one example by the increase in the prevalence of dengue. Hundreds of people in Tai'z city have dengue fever and local hospitals are accepting new cases on a daily basis. The number of infections increased due to the widespread use of uncovered water tanks, which, combined with the increased temperature and excess water after flooding, provides an ideal environment for mosquitoes to breed and then transmit the disease. The sick not only reduces the productivity of the infected individual but also of his or her care taker(s), which directly affects the livelihood of the household. Traditional livelihoods are also being challenged. In a vicious cycle, poverty makes people vulnerable to the effects of climate change and, in turn, climate change makes people vulnerable to poverty. The impact of climate change depends as much on socioeconomic vulnerability as on biophysical exposure. Biophysical impacts are superimposed on existing vulnerabilities determined by socio-economic factors such as an individual's age and gender; a household's asset base and degree of integration with the market economy; and a community's capacity to tap into social capital among local residents and to link to national support systems that will help build local resilience. In local communities with little resilience, climate change may compound existing vulnerabilities by eroding the asset base of the poor.

46. Responses to climate change need to include an understanding of the well-being and livelihoods of the poorest households and communities since they are less likely to be able to cope with the impact of climatic changes. Therefore, the asset base, which consists of cultural, financial, human, natural, physical, and social capital, as well as coping mechanisms (or the lack thereof) need to be addressed. Also the social capital and links with the local governments and institutions need to be strengthened. The local and community levels are important for sustainable adaption outcomes. Although there is little tradition for community participation in Yemen, there are experiences that can be used as a base, such as those gained by the agricultural CCD and Yemen Social Fund. However, decentralization is in its infancy and citizen engagement is limited; voice and knowledge of rights is limited; and transparency, access to information and complaint mechanisms are not part of governance.

47. The focus from the social and other sectors should be on reducing social vulnerability to climate change and variability by enhancing good governance and technical capacity at the local and national level; developing social capital in local communities to provide for voices to be heard, representation, and accountability; and strengthening the asset base of the poor by building strong and lasting physical infrastructure, safeguarding the natural resource base, expanding access to financial services, investing in human capital and supporting the development of social and cultural assets in the community.

48. NGOs, media, academia, mosques and other civil society organizations are key stakeholders, some of which are already engaged with communities. However, there is limited engagement in Yemen regarding climate change adaptation through practical action. Support is needed at numerous levels: from information and knowledge sharing on climate change and adaptation mechanisms to support to adapt planning and programs. Enhancing partnerships between communities, civil society and the GOY at national and local levels are a vital but challenging aspect of the integration of climate resilience in planning and programming.

49. Consultations and international experience can guide the PPCR and offer the opportunity to address these and other human and social aspects of climate change to:

- Increase awareness of climate change and the social and human implications therein;
- Enhance good governance and technical capacity in the public sector;
- Develop social capital in local communities: voice, representation, and accountability;
- Build household resilience through asset-based adaptation using a no-regrets approach;
- Address household and community vulnerabilities, including their resource base, coping mechanisms and risks;
- Closely engage and increase support for civil society organizations (NGOs, media, academia, mosques, etc) and build partnerships in knowledge sharing, advocacy and service delivery functions;
- Improve understanding of gender impacts and develop a strategy to address impacts on women;
- Address the weakened and threatened traditional knowledge by taking stock of, documenting and sharing successful traditional knowledge experiences;
- Increase support for vulnerable and marginal groups (women, those not allowed to own land, migrants and the disabled) and establish social security/social protection networks;
- Develop strategic partnerships between state and non-state actors.

50. Successfully addressing social vulnerabilities to climate change requires action and commitment at multiple levels. In a three-pronged approach, Appendix 10 offers key operational recommendations for strengthening the commitment and broadening the scope of climate change adaptation at the government, community, and household levels. Emphasis is placed on enhancing good governance and technical capacity in the public sector, building social capital in local communities and protecting the asset base of poor households.

Private sector

51. During the PPCR scoping mission to Yemen, meetings and discussions were conducted with government officials, community representatives and university members to evaluate and assess private sector as one of the components in the program.

52. Yemen's major economic sectors include agriculture, fishing and tourism. The private sector is dominated by Micro, Small and Medium Enterprises (MSMEs) whose economic and knowledge capacity is ineffectual. They are, therefore, highly vulnerable to the impacts of climate change. Initial assessments revealed that water availability and coastal and marine biodiversity are major concerns that will directly and negatively impact Yemen's major economic and, transitively, private sectors.

53. The private sector in Yemen is still developing and there are many areas being addressed by both donors and the GOY, including creating a better business environment, environmental legislation and laws, SMEs financing mechanisms and private sector capacity. In that regard, the PPCR can build on these interventions to promote emerging climate resilience technologies in the private sector.

54. The private sector under the PPCR is likely to significantly contribute to the overall success of the program and will maximize its development impact. The following actions were suggested as ways to work with the private sector to maximize the benefits of the PPCR:

- Conduct a detailed impact assessment study to identify priority sectors and assess the impact of climate change on the private sector in such identified priority sectors. The NAPA study should also be considered as valuable input for the assessment;
- Establish dialogue between the private sector and other stakeholders to develop an implementation strategy in priority sectors;
- Ensure coordination between the PPCR, the IFC and other donor-supported interventions to avoid duplication of investments and develop synergies.

Section 8: Targeting and Working with Communities

55. Given the limited capacity of the GOY, civil society and the private sector paired with the risks faced by the country, actions and initiatives will be most sustainable if driven by the local communities e.g. in a CDD type process. Local communities are in the front line when it comes to climate change impacts. Communities are the first to suffer from climate change's negative impacts, and be first responders (adaptation and building resilience and coping mechanisms). Priority vulnerable sectors or themes potentially addressed by the PPCR include water availability, agriculture, fisheries and rural infrastructure, which each involve both rural and urban communities.

56. The potential effects on communities and the poor include water scarcity, which may lead to the loss of livelihoods, massive migration, increased risk of conflict, decreases in school enrolment and attendance (especially for girls as water chores entail significant additional travel time), reduced agricultural production and yields, temperature variability, new diseases and pests and rising sea level, which negatively impacts fisheries and may exacerbate the food security situation. Changes in weather patterns may put rural infrastructure at higher risk due to increase intensity of storms and floods.

57. In order for the PPCR to be effective, communities need the support of sub national and local authorities and leaders (e.g. elected officials and religious leaders at all levels) and of central government agencies (e.g. line ministries and deconcentrated representatives). To this effect, the Social Fund, with its existing and functioning network and social infrastructure, should play a key role at the outset in the design of the PPCR in Yemen and in its implementation. The presence of the Social Fund on the ground should be one of the selection criteria for the 2-3 pilot areas/governorates to be targeted by the PPCR. Any community-based disaster management or risk reduction associations in the country should also be represented during the development of the program. Partnership with NGOs has the potential to increase penetration and absorptive capacity.

58. The PPCR must work effectively with communities by building credibility and trust. Credibility is built on transparency, fairness, participation, accountability and tangible results in a reasonable time frame. Communities need a forum in which they can voice their concerns, prioritize needs and allocate responses: a forum where they know they will be heard. The use of existing and credible forums (community development committee/councils, community organizations or associations) should be encouraged. However, work with communities is a continuous learning process. There is no one-size-fits-all formula and those implementing the PPCR must be flexible.

59. Striking the right balance during resource allocation between capacity building activities and physical investments is critical. A comprehensive and well-design capacity building action plan for stakeholders at all levels should be an important element of the design of the program. Sufficient and adequate amounts of resources should be allocated accordingly.

60. There is a need for a strong and well thought-out communications strategy from the outset. The strategy should not only focus on sensitivitization and awareness regarding the climate change agenda, but also on reaching out as broadly as possible to beneficiaries. Communication of ideas is important through channeling feedback between those in the field and decision makers. All communication tools available (e.g. information campaigns, open forums, newspapers, radio/TV advertisements, mosque services and pamphlets), including new technologies (e.g. the internet via Facebook, Twitter, blogs) should be used, focusing particularly on specific groups (e.g. youth, women, etc.).

61. Risks associated with targeting communities include the mismanagement of or improper selection of extremely politically charged pilot areas; spreading the PPCR too thin (geographically, sectorally, institutionally), which can limit implementation effectiveness and impact on the ground; introducing partisan politics into the PPCR processes (real or perceived); and insufficient deliberation on implementation tasks (e.g. assessments of effectiveness, technical aid, fiduciary relationships, disbursement of funding or resources, safeguards, etc.). As a final note, keeping the project design as simple as possible is always advisable in environments with low institutional capacity.

Section 9: Potential Phase I Activities

62. The purpose of Phase I is to help Yemen put in place an appropriate institutional, policy and planning framework where climate resilience is mainstreamed and appropriate adaptation measures are identified for implementation. This list of activities is preliminary and must be coordinated with actions planned by other development partners. Integration should be supported at the national level, followed by support for the sector ministries and sub-national level departments. Phase I activities could also support "no-regrets" actions (i.e. development activities addressing underlying vulnerabilities to help buffer vulnerable groups against climate trends or shocks; or immediate improvement of meteorological and agricultural data collection to improve planning and future implementation of projects). The following six sections highlight potential actions during Phase I.

Analysis of climate risks, development and management for a national environmental database

- Rapid vulnerability assessments of priority sectors in selected provinces, including social vulnerabilities;

- Development and management of a national environmental database, including, *inter alia*, the establishment of systematic monitoring stations, the assembly of relevant data from various agencies to a centrally managed environmental data repository, and the establishment of data sharing protocols. Currently, incomplete datasets are maintained by various institutions and duplication of data collection by various agencies is commonplace;

- Establishment of a centralized, national authority responsible for climate information management as a matter of high priority. This authority would coordinate and work with partners to undertake environmental data collection, quality assurance, climate modeling and projections, including reporting and dissemination. To maximize impact and transparency, data would ideally be accessible via the internet in near real-time. All national data (from all relevant agencies e.g. NWRA, CAMA, AREA, etc.) should be available free of charge for legitimate and registered users, including government agencies, research institutes and partner organizations. A business plan should be prepared with a view to sustaining the data authority over a 20-50 year time horizon. In due course, the data assets would become an integral part of Yemen's adaptive management and research efforts.

Mainstreaming climate into planning, policies and budgets

- Mainstreaming climate risk concerns into national and sectoral policies and developing related monitoring and evaluation indicators. Close dialogue should be maintained with other development partner initiatives in climate change adaptation, but also in the related fields of disaster risk management, food security and water management to ensure that PPCR activities complement and build on these undertakings;

- Mainstreaming climate change concerns into budgetary, allocation and reporting/tracking processes;

- Incorporating climate risk concerns into the project preparation and prioritization process, including relevant appraisal tools, such as environmental impact assessment, as well as into related criteria for prioritizing development and investments

Institutional aspects

63. The issue of institutions and institutional assessments is a key part of any transformational approach. First and foremost, climate is recognized as a core development issue that needs to be addressed by various institutions, formal and informal, national and provincial and local, and included in work with local cooperatives and civil society organizations. This should include:

- Taking stock of current mandates, responsibilities, capacities and skill sets with the aim of strengthening those aspects;

- Consultations on the findings and specific propositions related to institutional rearrangements and reforms;

- Recommendations targeted at various levels (e.g. rapid capacity building, medium- to long-term capacity needs and enhanced mandates to incorporate climate aspects);

- Review of selected governorate and local council level development plans, combined with the identification of suitable entry points for the creation and/or modification of provincial policies and regulations focusing on harnessing synergies between climate change adaptation and disaster risk reduction at commune and provincial levels (e.g. community-based disaster risk reduction schemes).

Stakeholder consultations and raising awareness

- Active involvement of each affected community by playing a direct role in the process. Consequently, in order to ensure active role-playing by the community in the PPCR, all-inclusive stakeholder consultations are very important. Reaching out to all relevant stakeholders and improving their understanding of climate change risks and vulnerabilities through mass media, education, group discussions, active involvement of communities and civil society are a pre-requisite for the successful implementation of the PPCR. For example, in the water sector some of the awareness-raising activities could include elaboration of the IWRM approach with active participation from all relevant institutions, especially MAI, NWRA, rural and urban water supply and sanitation sectors. This would instill a better sense of water resources development and management at a basin scale, rural and urban interface in terms of sharing responsibility to develop and resource management at a meaningful spatial scale—usually at a basin scale;

- Maintenance of a public website in which climate change related activities in Yemen, including the PPCR, are shared with the public at large.

Capacity building

- Build the capacity of a technical secretariat, established within the EPA, to support the implementation of the PPCR and to provide the EPA with technical support. The technical secretariat should be equipped with adequate technical and support staff, communication specialists, office space and other materials that facilitate the Secretariat's work. Capacity building is also necessary in other sectors in order to help mainstream climate change resilience within the various national (e.g., the 4th five-year social and economic development plan for poverty reduction) and sectoral (e.g. water, agriculture, fisheries, etc.) development plans. As such, technical assistance will be needed to complement the activities of line agencies with expertise on climate change and adaptation options.

- Strengthen institutional capacities of national-, governorate- and local-level institutions to integrate climate risk and resilience in policy, planning and budgetary processes. That would include mainstreaming community-based traditional and indigenous knowledge in adaptation and disaster risk reduction plans, strengthening institutional coordination for climate resilience and establishing or strengthening rural development and disaster management councils and committees.

Pilot activities

- A proposition was put forth to select two governorates, based on clear agreed criteria (e.g. good governance, good capacity, ongoing programs, etc.), for piloting of PPCR investments. The selected pilots should serve multiple objectives on the ground by showing climate resilience in key sectors (e.g. agriculture, coastal zone, community and livelihood issues, decentralized capacity, harnessing local communities, women and CSOs etc.).

Section 10: Agreed Next Steps

- EPA will review and provide comments on the draft mission Aide-Mémoire by December 25, 2009.

- EPA will consult with all line ministries regarding their needs for further technical assistance and research, and will produce a proposal for Phase I of the PPCR by January 25, 2010.

- EPA will update its roster of local and international experts, building on the NAPA roster, by January 25, 2010.

- EPA will set up a network for communication and outreach (e.g., email list of civil society groups, NGOs, academia and research institutions, etc); this should be an ongoing activity, but the EPA shall complete the first group by December 25, 2009, to be used for sharing the translated Aide-Mémoire and proceeding workshops.

- EPA will develop a draft proposal, including cost estimate, for Phase I of the PPCR (for up to $1.5 million). EPA shall share with the Bank the draft proposal by January 25, 2010.

- Prepare Terms of Reference (TOR) for staff of the technical secretariat within the EPA, including for an executive-secretary or program coordinator, two to three senior

technical specialists to support PPCR implementation, one technical specialist to support the EPA. A communications officer and a translator will be coordinated with other sectoral line ministries to help them implement Phase I activities. The EPA, with help from the World Bank, will finalize preparation of the TOR by January 25, 2010.

- EPA will prepare a TOR for a consulting firm to conduct data needs and gap analyses, establish a common environmental database and data sharing protocol, including the necessary equipment (hardware and software). The EPA will do the above with help from the World Bank to finalize preparation of the TOR by February 15, 2010.

- The World Bank will provide a consultant to assist the EPA in finalizing the proposal in mid-January 2010.

Appendix 1: TOR First Joint Mission

The World Bank
Middle East and North Africa Region
Sustainable Development Sector Department (MNSSD)

First Joint Mission - Yemen Pilot Program for Climate Resilience
Terms of Reference

October 28, 2009

1. Background

Vulnerability Context: Yemen has already been experiencing significant climatic change. The historical records since the 1970s indicate continuous warming over time. The trends show more rapid increase in summer temperature (+0.2°C/decade) than in winter temperature (+0.15°C/decade). In terms of rainfall, while there does not seem to be an obvious trend of total annual precipitation,[24] the extreme events are increasingly becoming a source of concern. On October 25, 2008[25], flash floods have claimed the lives of more than 140 persons and left more than 20,000 without shelter in the Hadhramout and Maharah provinces.

Further changes are expected in the future, with considerable impacts on freshwater availability in the country, and hence on the nation's critical economic sectors (including water, agriculture and health). According to the Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report, Yemen is expected to warm by 3-4° C by 2080 under the A1B SRES simulation scenario—which is roughly 1.5 times the global mean response. The outlook for precipitation is less obvious. There is no clear pattern of consensus amongst the 21 Global Circulation Models (GCMs) by IPCC AR4 about the sign of the projected changes in winter, summer or annual rainfall over Yemen. The projected distribution of precipitation in Yemen will also be more erratic, with possible higher frequency of high-intensity events. This will have significant implications on flood risks; land degradation; and availability of water for various uses, including agriculture, urban areas and the industrial sector.

Yemen currently faces serious problems of extreme water scarcity[26]. It has one of the lowest rates of annual per capita freshwater availability (195 m^3) in the world, compared to a regional average annual per capita of 1,250 m^3. Water use efficiency is low and the capacity to manage water resources is also weak, despite the hydrological scarcity prevalent in the country.

Rapid development of water supply has helped develop Yemen's agriculture sector, which currently uses some 90% of the total water resource available. However, water demand is still rising, while water resources are virtually all developed, and competition is growing between users at both local and regional levels. A major concern is groundwater, which is being mined at an alarming rate—depleted at more than four times the recharge rate in some major aquifers. Because of its dependence on unpredictable water availability (surface water that is extremely vulnerable to changes in climate, and groundwater resource that is fast depleting), the relatively strong agricultural sector in Yemen is highly exposed to the risks of climate variability and change.

[24] Some regions in the country are becoming drier, others wetter. For example, since 1970 annual rainfall has fallen at all 7 stations close to Wadi Tuban whereas 6 out of 11 show modest increases in the Wadi Zabid.
[25] Reported on the CNN news website @ http://edition.cnn.com/2008/WORLD/meast/10/25/yemen.flooding/index.html
[26] According to the World Health Organization (WHO), a nation with annual per capita water resource of less than 1,000 m^3 is considered a high water scarce country.

Furthermore, Yemen's coastal ecosystems are vulnerable to extreme climatic events and to the impacts of rapid warming. Sea level rise will increase coastal flooding, raise costs of protection, lead to deterioration of wetlands, mangroves and corals, and increase saltwater intrusion into surface and groundwater, thereby impacting key sectors of the economy. The predicted decline of almost 15% of the country's GDP from the fisheries sector will have a severe impact on economy which employs a significant number of the population that live along the coast.

In sum, to the extent that it can exacerbate water stress, jeopardize food security, pose irreversible threat to the natural and agro-ecosystems and increase exposure to natural disasters, *climate variability and change is a pressing poverty and development issue that might not only hinder achievement of the Millennium Development Goals (MDG), but could even undo the modest gains in economic growth the country has recorded in the past few years.*

Pilot Program for Climate Resilience (PPCR) as a Response Mechanism: Due to its high vulnerability to climate change, Yemen has been invited to participate in the Pilot Program for Climate Resilience (PPCR) as one of the pilot countries. PPCR is the first program under the Strategic Climate Fund (SCF) of the Climate Investment Funds (CIF). The objective of the PPCR is to provide incentives for scaled-up action and transformational change through pilot projects that demonstrate how to integrate climate risk and resilience into core development planning, while complementing other ongoing development activities in a given country. PPCR program will be country-led, and will enable pilot countries to transform country-specific plans and investment programs to address climate risks and vulnerabilities, building on National Adaptation Programs of Action (NAPAs) and other relevant country studies and strategies. Substantial programmatic resources will then be made available to help fund the newly identified public and private sector investments.

Under the PPCR, up to 1.5 million dollars will be allocated for the selected pilot countries for the preparation of the *Strategic Program for Climate Resilience*, and $30-60 million will be made available for implementation of each pilot program in the key vulnerable sectors, with approximately half of the fund available for grant financing and the rest is in the form of highly concessional loan. Pilot countries will not be obliged to accept concessional loan financing as a condition for receiving grants.

PPCR process is divided into two phases. In Phase I, a *Strategic Program for Climate Resilience (SPCR)* will be developed, and specific projects/programs that are proposed in SPCR will be implemented in Phase II. The indicative timeframe for Phase I is in the range of 3 to 18 months, with an understanding that most countries will choose and be able to achieve the aims of the process within a year from the time of the joint mission. The key activities during Phase I include: a) initial joint mission to develop a proposal and budget for the *Strategic Program*; b) tasks related to the development of the *Strategic Program*; c) second joint mission to review and finalize the *Strategic Program*; and d) Submit the final *Strategic Program* with specific investment recommendations as the output of Phase I. This mission constitutes the first joint mission that will embark on the formal process to develop the SPCR.

PPCR Progress in Yemen: In preparation for the first Joint Mission, the World Bank and the GOY conducted a scoping mission from July 18-24, 2009 with the objective to: (i) review and consolidate relevant on-going activities on climate resilience in the different sectors, (ii) discuss the objectives structure and phases of the PPCR, (iii) identify preparatory work required prior to the planned first Joint Mission, and (iv) coordinate with active development partners and agencies to share information and identify possibilities to enhance the effectiveness of the program. The scoping mission was able to introduce the PPCR and its objectives, and lay a good initial ground for discussion with various stakeholders. The following progress has been made on the key agreements reached during the scoping mission:

1. *Establishment of the Inter-Ministerial Climate Change Council*—it was agreed that the MWE will send its request for the formation of this Council to the Cabinet. The text of the decree has been

finalized for Cabinet consideration, and should be approved before the start of the Joint Mission in mid November

2. As agreed during the scoping mission, and in order to facilitate coordination and collaboration by various stakeholders, including relevant line ministries and agencies within the GOY and development partners, EPA has prepared a complete list of stakeholders who should be consulted and engaged as part of the PPCR process. Stakeholder consultations during the Joint Mission will draw from list. It was also agreed that EPA will compile all relevant studies/ investment projects and TAs that deal with climate related issues by end of September 2009 – this has been done. This will help facilitate review of available information and lessons learned, and identify gaps for implementation under the PPCR. This list will guide the discussion and presentations during the Joint Mission – as a first step of the Phase I stocktaking process.

3. Given that the output of the first Joint Mission is a project plan for Phase I, including staff and budget, it was agreed that EPA will prepare a draft project plan for review and expansion during the first joint mission.

2. Timeframe

Timeframe for initial joint mission—The first joint mission is planned to take place from November 14-23, 2009 The mission, will in include a two day workshop in order to brainstorm and share knowledge with a wide variety of stakeholders (government, civil society group, development partners, etc) regarding climate related issues in Yemen, interventions (completed/ ongoing/ planned), lessons learned, and identify opportunities to complement existing and planned activities Given their experience on climate change related issues in Yemen, partnership with UNDP, EU, IFAD, and bilateral development partners will be sought.

The TOR for this first joint mission was jointly prepared by the GOY, The World Bank and IFC.

3. Mission Objectives

Following PPCR guidelines, the main objective of the joint mission is to assist Yemen to put in place a clear process for formulating a Strategic Program for Climate Resilience. The mission will review progress, plans, and strategies that take account of climate risks, as well as other relevant information, and provide a platform for joint work of the development agencies, the private sector and NGOs to support the GOY in the formulation of an agreed strategic approach and investment program for integrating climate resilience into core national development and key sector strategies and actions.

4. Scope of Work

The main activities of the joint mission will include: (i) follow up on agreed actions during the scoping mission in July 2009; (ii) taking a stock of country level activities on climate resilience, and identification of gaps, based on the overview of studies/investment projects implemented in the country; (iii) initial assessment of opportunities for mainstreaming climate resilience in national and local development policy, planning, regulatory and budgetary processes and in the key vulnerable sectors; (iv) broad based consultations with national stakeholders and development partners; (v) identification and outline of implementation arrangements for the activities under Phase I; (vi) preparation of a detailed proposal for developing the Strategic Program during Phase I to include, *inter-alia*, a work program, timetable, implementation arrangements, roles and responsibilities and budget.

The scope of the mission's work will specifically focus on the following tasks:

Country Stocktaking on Climate Resilience*:* The mission will take stock of current country-level activities which could or do build climate resilience, and will focus on the following key issues:

(a) Assess current practices, institutional arrangements and capacity for the use of climate risk information in relevant institutional structures (national, regional, local) and in cross-sectoral mechanisms; and assess agency mandates for addressing climate change adaptation. The partial list of ongoing and implemented climate related activities in Yemen developed during the scoping mission should be completed. The assessment should include the adequacy (coverage and quality) of existing data and other information on climate risks, vulnerabilities and adaptation assessments and the capacity building needs in relevant agencies, in order for them to provide and apply timely, targeted, credible and defensible climate risk information, including climate forecasts and projections, as appropriate to specified timescales and applications

(b) Assess the range of available relevant information and participatory processes to determine climate related vulnerabilities and impacts of key economic sectors and stakeholders including the private sector), and identify significant gaps;

(c) Identification of gaps which need to be filled and prioritization of these for consideration under Phase I of the PPCR.

Sector Assessments: The mission will undertake an assessment of relevant sector development policies and strategies and identify needs and options to integrate climate change adaptation with the support of the PPCR in order to make climate resilience an integral part of the country's development and sector strategies. This will also build on the work that the GOY has done under its NAPA.

Broad Based Consultations: The mission will consult widely with key national stakeholders, including civil society and academia, development partners and the private sector to the extent possible in order to incorporate a wide range of views. This participatory process would help to build national ownership of the PPCR, and reach consensus on the priorities for action by the public and private sectors given the climate risks facing the country.

Identification and Outline of Phase I Activities: The mission will prepare an annotated outline of the proposal for preparing the Strategic Program for Climate Resilience to be attached to the Aide Memoire. This would include the activities to be carried out, implementation arrangements, timetable, budget and expected results.

Work Program and Funding Proposal to Develop the Strategic Program: Following the mission, the government, supported by the World Bank and IFC (and in consultation with other development partners as identified commonly during the mission), will prepare a detailed work program and funding proposal for carrying out Phase I activities, which will result in preparing a Strategic Program on Climate Resilience. This will follow the general structure provided in the "Guidelines for Joint Missions to Design PPCR Pilot Programs (Phase I)."

5. Mission Outcome:

The following would be the main outcomes of the mission:

a) Substantive discussions on climate related issues and opportunities in Yemen with a wide range of stakeholders, involving various agencies in the GOY, development partners, private sectors, and civil society groups (NGOs, academia, etc), and better

understanding of priorities identified by the government in-line with its development agenda;

b) An Aide Memoire (jointly produced by the Government and the Bank), including an Annex presenting an outline of the Phase I activities (Annotated outline of the draft proposal to develop the Strategic Program for Climate Resilience); stocktaking of relevant ongoing activities and initiatives, including upcoming priority sectors for PPCR, ongoing and planned programs and large investments funded by governments and development partners that are highly climate sensitive and activities addressing climate resilience; and

c) Draft Work Program and Funding Proposal to develop the Strategic Program to be prepared by the government for submission to the PPCR Sub-committee (to be completed after the mission).

6. Mission Composition

The mission will be carried out under the auspices of the Ministry of Planning and International Cooperation, with technical coordination and support provided by Mr. Anwar Noaman, Head of the Climate Change Unit, Environment Protection Authority.

The mission is suggested to comprise the following specialists:

- *Agriculture Specialist*: working closely with relevant line ministries and development agencies active in the sector, assess current climate risks to agriculture and related sector investments including relevant infrastructure as well as on-going and/or planned projects and programs, and the potential for increasing climate resilience in the sector; Garry Charlier, Senior Operations Officer, World Bank;

- *Water Sector Specialist*: working closely with relevant line ministries and support groups, assess current climate risks to water and related sector investments including infrastructure as well as on-going and/or planned projects and programs, and the potential for increasing climate resilience in the sector; Bekele Debele Negewo, Water Resource Specialist. World Bank

- *Natural Resource Management/CZM Specialist*: working closely with relevant line ministries and support groups, assess current climate risks to ecosystems and related investments, including on-going and/or planned projects and programs, and potential for increasing climate resilience; Kanta K. Rigaud, Sr. Environmental Specialist, World Bank

- *Social Sector Specialist*: assess the social dimensions of climate risks relevant for the Strategic Program on Climate Resilience; Dorte Verner, Sr. Economist, World Bank

- *Private Sector Specialist*: assess climate risk related issues of the private sector (IFC);

- *Institutions Specialist:* working closely with all of the technical specialists to assess the present mandates and capacity of relevant institutions to engage in climate risk management activities and to implement specific activities under the program; assess institutional capacity of sectoral units for cross-sectoral collaboration in order to implement climate adaptation projects that span across sectors; and identify opportunities for capacity building that could be supported through the program; Kanta K. Rigaud, Sr. Environmental Specialist, World Bank

- *TTL*: Assist EPA in coordination of the mission, lead the dialogue with government, national stakeholders and development partners; assist EPA in preparing the Aide Memoire, and finalizing work program and funding proposal. Dorte Verner Sr. Economist, World Bank

- PPCR Coordinator: To assist EPA in the coordination of the mission, its preparation, drafting of Aide Memoire and funding work program and proposals, and reporting. Johanne Holten, JPO, World Bank and Gamal Al Harrani, Consultant.

From the World Bank side Mmes/ *Messrs Dorte Verner* (Sr. Economist and Task Team Leader, MNSSD), Naji Abu Hatim (Sr. Rural Development Specialist, MNSSD), Kanta K. Rigaud (Sr. Environmental Specialist, MNSSD), Bekele Debele Negewo (Water Resources Specialist, MNSSD), Johanne Holten (JPO, MNSSD) and Gamal Al Harrani (Consultant) will participate in the mission. FC will also participate in the mission.

7. Timeframe

It is envisaged that the mission will consist of a total of 5 weeks of work including the preparation of the mission, the time on the field and report writing. The mission will be in Yemen during November 14 – 23, 2009.

8. Partners

- Ministry of Planning and International Cooperation (MOPIC) - Chair
- Ministry of Water and Environment (MWE)
- Environmental Protection Authority (EPA) – technical secretariat
- Ministry of Agriculture and Irrigation (MAI)
- Ministry of Fish Wealth (MFW)
- Ministry of Finance (MoF)
- Ministry of Local Administration (MoLA)
- National Water Resource Authority (NWRA)
- Civil Aviation and Meteorological Authority (CAMA)

The following stakeholders will further be included: civil society, private sector and academia to ensure that the process of elaboration of the climate resilience development plan is inclusive and reflects the needs and priorities of these different groups. This has been confirmed in the Governments Acceptance of offer to participate template dated June 21, 2009.

Development partners including the following shall also be engaged in the Joint Mission based on their on-going relevant engagement on the agenda:

- GTZ/KfW/BGR
- UNDP

- JICA/JBIC
- The Netherlands
- DFID
- USAID
- DANIDA
- IFAD
- EU
- AFD

Appendix 2: Mission schedule and people met

Date	Time	Activity	People met	Contact Info
Nov 14. 2009	9:30	Meeting with Country Manager	Benson Ateng	bateng@worldbank.org
	12:00	Meeting with EPA to finalize agenda for the mission and final preparations for the regional workshop on climate change adaptation	Mr. Mahmoud Shidiwah, Chairman of EPA	epa-yemen@yemen.net.ye mahshidiwa@yahoo.com
			Mr. Anwar Noaman, Head of Climate Change Unit, EPA	Anwar.noaman@gmail.com
	16:00	Meeting with UNDP to present the mission and final preparations for the regional workshop in climate change adaptation	Ms. Pratibha Mehta, UNDP resident representative	
			Mr. Selva Ramachardran, Country Director, UNDP	Selva.ramachandran@undp.org +967-1-448 605
			Mr. Faud Ali Abdulla At-Kadesi, Team Leader, pro-poor economic growth	Faud.ali@undp.org +967-1- 448 605/8 ext 330
Nov. 15, 2009	9:00-4:30	Workshop: "Impacts of Climate Change in Djibouti and Yemen"	See participants list	
Nov 16, 2009	9:00-4:30	Workshop: "Impacts of Climate Change in Djibouti and Yemen"	See participants list	
Nov 17, 2009	9:30	Civil Society Consultation	See participants list	
	2:00	Donor Round Table	H.E. Abdul-Rahman F. Al-Eryani, Minister of Water and Environment	af.alryani@gmail.com
			H.E. Hussein A. Al-Gunied, Dep. Minister of Water and Environment	Hussien_algunied@yahoo.com
			Mahmoud Shidiwah, Chairman of EPA	epa-yemen@yemen.net.ye mahshidiwa@yahoo.com
			Anwar Noaman, Head of Climate Change Unit EPA	Anwar.noaman@gmail.com
			Faud Ali Al Kadasi, Team Leader, pro-poor economic growth, UNDP	Faud.ali@undp.org

			Zuzana Tollrianova, UNDP	Zuzana.tollrianova@undp.org
			Bohdana Rambouskova, UNDP	Bohdana.rambouskova@undp.org
			Chistian Flamant, AFD	flamantc@afd.fr
			Bernd Schoenewald	bernd.schoenewald@kfw.de
			Torge Tünnevmeier, BGR	bgr-sanaa@gnx.de
			Job Kleijn, EKN	job.kleijn@minbuza.nl
			Youshie Hama, Project formulation advisor, JICA	Hama.youshie@jica.go.jp (+967) 1 448006/448 117
Nov. 18, 2009	9:00	Meeting with EPA	Mr. Mahmoud Shidiwah, Chairman of EPA	epa-yemen@yemen.net.ye mahshidiwa@yahoo.com
			Mr. Anwar Noaman, Head of Climate Change Unit, EPA	anwar.noaman@gmail.com
	12:00	Meeting with Dep. Prime Minister, MOPIC	H.E. Abdukarim Asmaeel Al Arhabi, Deputy Prime Minister, MOPIC	
			Ms. Merna Hassan, MPIC	
	2:00	Working with EPA		
Nov. 19	11:00	Meeting with Dr. Torge	BGR regarding joint database development	
Nov. 20	1:00	Meeting with Abdulkarim	General Directorate of Irrigation, MAI	
Nov. 20	8:00 pm	Working with EPA		
Nov. 21	10:00	First meeting of the IMCCC	H.E. Abdukarim Asmaeel Al-Arhabi, Deputy Prime Minister, MOPIC	
			H.E. Abdul Rahman Fadel Al-Aryani, Minister of Water and Environment	
			H.E. Mohammed Saleh Shamlan, Minister of Fisheries Wealth	
			H.E. Kamal Husein Al-Gabri, Minister of Telecommunication and Information Technology	
			H.E. Ahmed Mohsen Al Ashlah Deputy Minister of Agriculture and Irrigation	
			H.E. Ali Mohammed Shater Muthena, Deputy Minister of Finance	
			H.E. Abdula Hassan Al-Shater, Deputy Minister for Projects Programming, MOPIC	ashater@mpic.gov.ye +967 1 250112

				Fax: +967 1 250605
			H.E. Abdul Malik Mohammed Alamah, Deputy Minister of Oil and Mineral Resources	
			Salim Hassan Ba Shuaeeb , Chairman Of National Water Resources Authority (NWRA)	
			Mahmoud M. Shidiwah, Chairman of EPA	
			Hani Mohammed Al-Buani, Deputy Chairman of MAA	
			Khalid Mohammed Saeed, DG, MOPIC	
			Abdul Karim Al-Sabri, DG, MAI	
			Anwer Abdul Aziz Noaman, Head of Climate Change Unit, EPA	
			Khalid Ahmed Gaber Afeef, DG, MOPIC	
	12:00	Working meeting with EPA		
Nov. 22, 2009	9:00	Meeting with JICA	Megumi Shuto, Project Formulation Advisor	Shuto.Megumi@jica.go.jp, (9671) 448 006/448 117
			Mohammed Al-Riashi, Administrative and Technical Cooperation Assistant	Mohammed.jicayemen@yemen.net.ye (9671) 448 006/448 117
	10:00	Meeting with Japanese Embassy	Mr. Hiroki Haruta, Second Secretary	Hiroki.haruta@mofa.go.jp (967-1) 423 700
	2:00 pm	Meeting with EPA		
	6:00 pm	Meeting with the Dutch	Job Kleijn	
Nov. 23. 2009	10:00	Meeting with DFID	Dylan Winder, Deputy Head for Yemen	
			Matthew Pointon, Economic Advisor	m-pointon@dfid.gov.uk +967 (1) 302 450 -3 ext 3364 Cell: +967 735590675
	11:15	Meeting with UNDP	Mr. Selva Ramachardran, Country Director, UNDP	Selva.ramachandran@undp.org +967-1-448 605
			Faud Ali Al Kadasi, Team Leader, pro-poor	Faud.ali@undp.org

			economic growth, UNDP	
			Zuzana Tollrianova, UNDP	Zuzana.tollrianova@undp.org
	13:00	Meeting in the IMCCC		
	15:00	Meeting with KfW	Jörg Dux, Director of water sector, North Africa and Yemen	
			Bernd Schonewald, Director, Sana'a office	
			Gunther Walter, Sr. technical advisor	
			Gerald Scholz, Project manager	

Appendix 3: Findings from Workshop - working groups

Working Groups Findings

CC Workshop Sana'a 16th/ November 2009

Objectives

To identify issues related to CC in Yemen and priorities for adaptation

Thematic Group	Key Issues/Risk & vulnerability to CC	Priority Interventions Required	Actions requested from others to implement interventions	Collaborating Sectors to ensure success of interventions
Water Resources	Rain fluctuations, floods, droughts, well salinity, water pollution, urban/rural disputes on resource allocation , desertification, qat,	Information exchange Strengthening data collection, developing monitoring networks, adaptation of CC models to local conditions, developing irrigation departments (remote sensing, GIS), use of modern technology suitable for Yemen conditions, developing water use efficiency, awareness raising campaigns, replacement of qat by other crops, allocation of appropriate lands to make private sector invest in , community participation including rural women, developing water harvesting projects, water management at basin level and water mapping	Gov't Implementing existing strategies and policies Sector prioritization Developing investment environment for the private sector Civil Societies Increase participation by all. Raising water awareness through the educational system Local community Raising awareness, water rights, just water allocations, increase of community participation, strengthening water users committees in basins Private sector Increase investment, water awareness Women Increase women participation in water management, training	Agriculture, Energy, local society, Universities and research centers, health, statistical centers, environment, local councils

			rural women, increase awareness	
○○Agriculture	Plant Production Genetic deterioration, rainfall fluctuations, deterioration of traditional agriculture heritage. Animal Production Decline in grazing land, spread of epidemic diseases, endemic and imported, decrease in quantity and quality of animal products	Support of research, extension and increase of seed production Increase of veterinary and animal health services	Gov't Support of local authorities <u>Local authorities</u> Encourage farmers and support their decisions <u>Private sector</u> Manufacturing irrigation equipment Reduction of intensive agriculture which depends on extensive water use Training <u>Civil Societies</u> Increase awareness on CC risks Awareness programs <u>Women</u> Raising awareness on CC risks	Water, civil societies, farmers cooperatives, farmers union, markets for agriculture products

Coastal Zones	Deterioration of coastal /marine habitats, wetlands/ groundwater, decline and movement of fish stocks, increase of risk and natural disasters, destruction of infrastructure and cultural heritage, deterioration of living standard and health	Support of research, extension and increase of awareness on cc risks in coastal/marine habitats, ecosystems and biota	Gov't – Putting coastal zone management plans and legislation implementation and mass media mobilization to raise awareness of cc risks in coastal areas Placing sound fisheries management plans Support fishers' and fishing communities. Replanting mangroves and expand their abundance in suitable areas. Establishing with local authorities fisheries management authorities Private sector Stopping reclamation Importation of non-destructive fishing gear. Developing ESIA for projects in coastal/marine areas Civil Societies Increase awareness on CC risks. Women Raising awareness on CC risks. Revitalizing their role in fishing communities	Marine Affairs, MFW, fishers' Cooperatives, fishers, Fisheries Research Authority, Department of Earth Sciences and Environment, Meteorological Authority, Local Councils, Navy, Tourism, Coast guard and other coastal/marine areas users
Community Development	Loss of archaeological heritage, decrease in water table, immigration, lack of food security gaps, lack of education and health facilities	Study of present situation Protection of archaeological sites, awareness in water conservation and water harvesting, awareness campaigns to reduce qat production and consumption, developing	Gov't Strict implementation of laws to protect archaeological heritage, support to farmers to encourage water conservation in irrigation, Civil Societies	Central and local Gov't agencies. Local civil societies, political parties' members, mass media and

	Decrease in food production	education and health facilities Participation of society in management of resources	Increase awareness on CC risks. Work with farmers in improving traditional techniques of water and soil conservation. <u>Women</u> Raising awareness on CC risks. <u>Private sector</u> Support of awareness and training programs Increase investments at local levels	societal personalities and leaders.
Social and Human Development	Lack of awareness of social and human implication of cc. Weakened and threatened traditional knowledge. Weak implementation of laws (e.g. water law, land use), weak capacity of people to cope. Limited resources (human, social and financial) Limited freedom for civil society. Lack of decentralization. Lack of Gov't support for civil society. Lack of education on CC. Lack of gender perspective. Lack of support for vulnerable and marginal groups (women, Akhdam, Abna Al Khumus	Institutional capacity Knowledge and data Information Research Awareness Freedom and mobility of civil societies	<u>Government</u> * Issue laws and enforce them * Collect and monitor data and information ;and share it * Coordinated agencies * Create and increase capacity for local government ,institutions, NGOs, communities households to deal with CC * Create incentive for private sector to intervene * strengthening research(e.g.in data ,analyze to include human and social issues related to CC) * Support cooperatives to	-cooperatives (fishers' and farmers) Universities and research centers Vocational training institutions

	landless who are not allowed to own land, disabled-physical and mental)		adapt to CC <u>Civil society</u> Dissemination of information and raising awareness <u>Communities</u> Contribute to monitoring and surveillance Create networking/network method to households in case of disasters <u>Private sector</u> Improve technologies that will facilitate improving cc adaptation and mitigation Educate employees about CC and adaptation Increase social responsibility <u>Cooperatives</u> Adapt to cc <u>Women</u> Active participation (e.g.in water preservation) Teaching children on the importance of environment, cc and adaptation	

Appendix 4 : Findings from stakeholder consultation

Group discussion results (Civil Society)

	Group 1	Group 2	Group 3
1) What are the most efficient ways to engage civil society and other groups (e.g. cooperatives, private sector) in climate change?	• Engage the civil society groups from the initial steps, through continues information sharing related to PPCR process. • Direct consultation with the civil societies and private sector on CC issues.	• Establish communication and coordination mechanism reaches all civil society groups.	• Establish communication and coordination mechanism reaches all civil society groups. • Formulate projects on climate change reflects vulnerable sectors and sites, with civil society consultation, involve them on its implementation. • Prepare capacity development programs to build capacity of civil society groups on climate change
2) How can civil society and other groups be of help in formulating and implementing the Strategic Program for Climate Resilience in Yemen?	• Develop capacity of NGOs on plans preparation • Facilitate NGOs participation on early warning system training • Formulate environmental and adaptation to CC guidelines • Use media and news papers for awareness raising on CC impact and other aspects • Present and determine the real local CC related issues and reflect them on the SP	• Improve community knowledge on CC through awareness raising program • Observe and document CC impacts and vulnerable sites on different areas. • Ensure gender participation in CC related issues • Develop pilot projects and involve local communities in its implementation process. • Participate in the SP preparation and make suggestions for CC adaptation	• Involve the civil society groups on formulating the program documents and on the future implementation process. • Mainstream CC information to down levels • Build technical capacity of the local communities on CC. • Provide incentives to private sector and encourage them to include the climate resilient issues in the future development.
3) What concrete ideas do you	• Document the local	• Develop projects on	• Undertake the scientific

have for the PPCR to improve climate resilience in Yemen?	indigenous knowledge related to CC and accommodate it to PPCR strategic program. • Implement condense awareness program. • Coordinate with related agencies and civil society • Provide technical support to active civil society • Reflect real in ground CC local issues on PPCR • Establish CC information and data related center	agricultural terraces rehabilitation. • Train/qualify the civil society groups on CC issues	research on CC resilience. • Support national research Authorities, Centers and Universities. • Consider use of the useful indigenous knowledge on climate change adaptation and national resources conservation during formulating the Strategic Program. • Establish easy access communication network between NGOs and PPCR management • Develop awareness program on CC.

The above matrix contains results of groups discussion summary carried out by civil societies and academia on November 17 2009. This is to give primary overview how the civil society thinks on CC issues.

Appendix 5:

Yemen and Climate Change

Historical climate variability and trends for Yemen—long-term, systematic observations of precipitation and temperature are very scarce in Yemen. Early, short-lived precipitation records exist for Sana'a in the 1930s and 1940s, and for Tai'z in the 1940s and 1950s. Most climate data are tied to specific water resources and agricultural projects, or to short-term campaigns. The longest (but incomplete) record of monthly rainfall and temperature is available for Aden since 1881. Given the brevity and quality of records, and sparse networks, there is limited scope for evaluating long-term trends in climate variables, especially for extreme events. The monthly mean temperature record at Aden suggests more rapid warming in summer (+0.2° C/decade) than in winter (+0.15° C/decade) up to 1967. The trends for Aden are consistent with widespread warming of average and extreme minimum temperatures reported for the region.

According to some studies, there has been a severe July-September drying trend since the 1950s across the Sahel that extends into Yemen. Annual precipitation totals across Yemen exhibit considerable spatial and temporal variability as is typical for arid regions (see Figure 1). For example, according to a study (daily rainfall monitoring during 2007) conducted by the Water and Environment Center of the University of Sana'a, the northern suburbs of Sana'a City receive just 42% of the accumulation recorded in the south of the city. Another relatively dense network of gauges shows that since 1970 annual rainfall has fallen at all 7 stations close to Wadi Tuban; whereas 6 out of 11 show modest increases in the Wadi Zabid (see Figure 2).

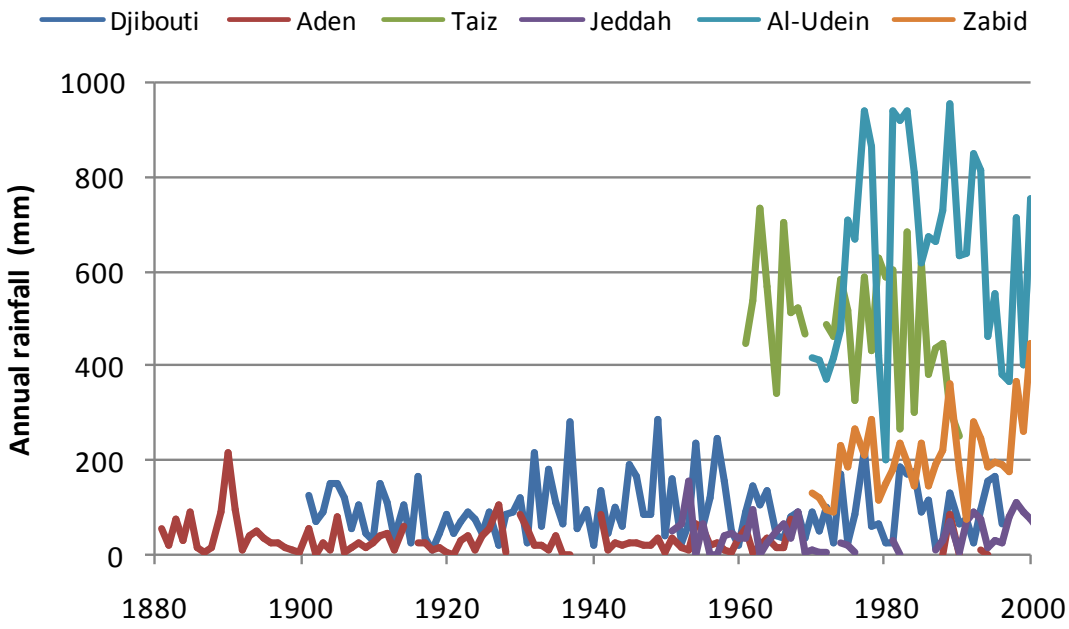
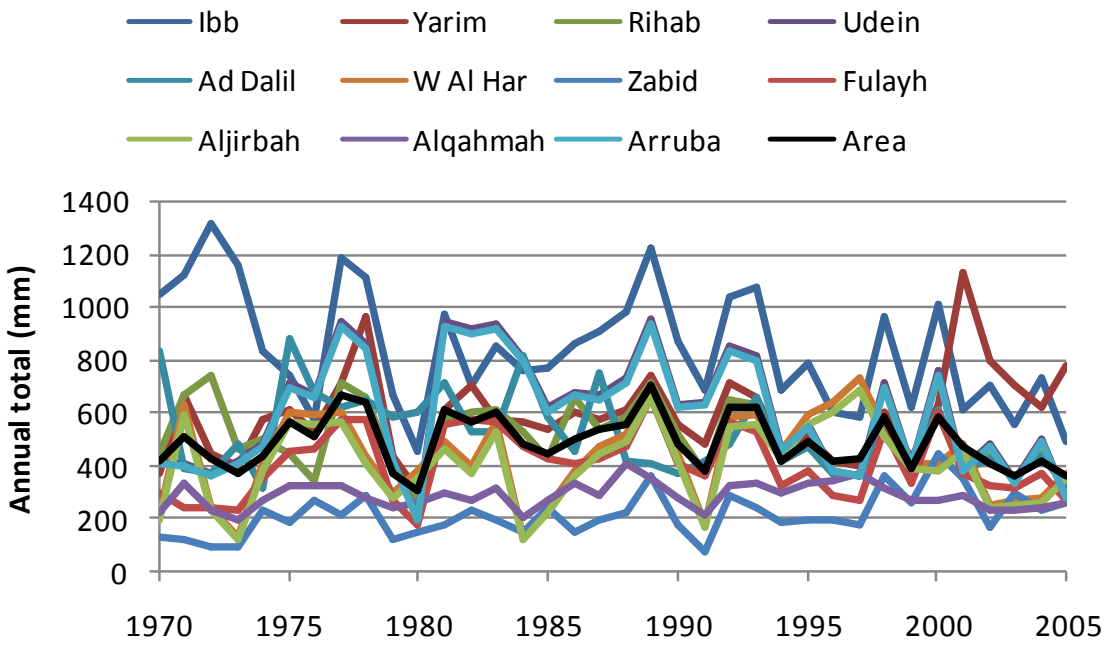


Figure 1. Annual precipitation totals at Djibouti, Aden, Tai'z and Jeddah. Data source: KNMI Climate Explorer (http://climexp.knmi.nl/getstations.cgi).

4. Annual and seasonal precipitation anomalies across Yemen do not correlate significantly with either El Nino episodes (Pagano et al., 2003[27]), or with the Indian Ocean Dipole (IOD) (Saji and Yamagata,

[27] Pagano, T.C., Mahani, S., Nazemosadat, M.J. and Sorooshian, S. 2003. Review of Middle Eastern hydroclimatology and seasonal teleconnections. *Iranian Journal of Science and Technology*, **27**, 95-109.

2003[28]). However, there is a week negative correlation (*r*=-0.4) between summer (August) monsoon rainfall at Tai'z and the strength of the Indian monsoon. Observations and proxy climate reconstructions show that over multi-decadal and century timescales, the North Atlantic Oscillation has been the dominant influence on large-scale patterns of winter precipitation, stream flow and surface temperature across the Middle and Near East (Cullen et al., 2002[29]). Moreover, trends in Middle East daily precipitation indices, including the number of days with precipitation, the average precipitation intensity, and maximum daily precipitation amounts, are weak in general and do not show spatial coherence (Zhang et al., 2005[30]).



[28] Saji, N.H. and Yamagata, T. 2003. Possible impacts of Indian Ocean dipole mode events on global climate. *Climate Research*, **25**, 151-169.
[29] Cullen, H.M., Kaplan, A., Arkin, P.A. and Demenocal, P.B. 2002. Impact of the North Atlantic Oscillation on Middle Eastern climate and streamflow. *Climatic Change*, **55**, 315-338.
[30] Zhang, X.B, Aguilar, E., Sensoy, S., et al. 2005. Trends in Middle East climate extremes indices during 1930-2003. *Journal of Geophysical Research* , **110**, D22104, doi:10.1029/2005JD006181.

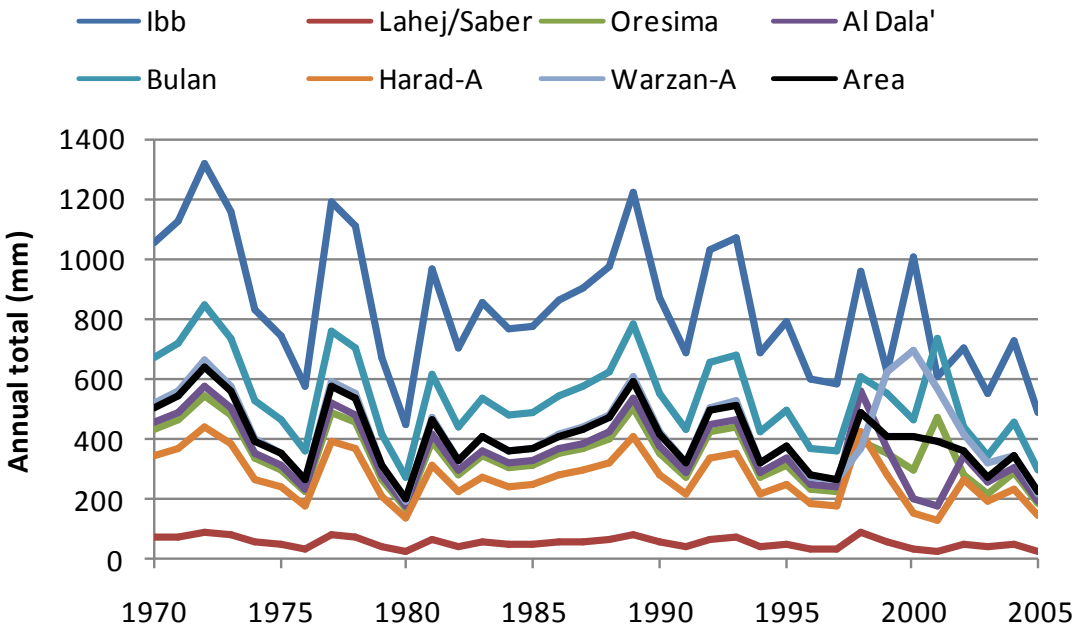


Figure 2. Annual precipitation totals in Wadi Zabid (upper panel) and Wadi Tuban (lower panel). Data source: Tehama Development Agency.

Climate model projections—the Intergovernmental Panel on Climate Change (IPCC) in its Fourth Assessment Report projects higher rates of warming over East Africa and the Arabian Peninsula than the global average[31]. This finding is based on an ensemble of 21 global climate model (GCM) simulations which also shows on average increased winter, summer and annual precipitation totals over Yemen. Whereas good agreements are normally available amongst the models on temperature change predictions, there is no clear consensus about the sign of the projected changes in rainfall for Yemen. An even much less agreement among the models is observed for extreme events. This large uncertainty is presumably related to poorly characterized precipitation processes for East Africa and the Arabian Peninsula within the present generation of climate models. Even under observed climate conditions, regional climate models such as RegCM3 are known to overestimate rainfall totals in areas of high elevation [32] that characterize most of East Africa and Yemen.

Climate change impacts: projected rises in temperature and sea level, as well as increased climate variability and extremes, and more intense floods and droughts, due to climate change impacts are expected to have greatest impact on Yemen, especially on the livelihoods of the poor. In Yemen, climate change impacts are expected to be particularly acute on account of historical patterns of climatic variability, of high levels of water scarcity and overall degradation of resource base such as soils and coastal ecosystem, and of the country's reliance on climate-vulnerable sectors such as agriculture. With per capita annual water resources of only 195 m^3, Yemen faces extreme water scarcity even without climate change impacts. Annual precipitation in the country is on average very low, ranging from less than 50 mm in the coastal plains and desert plateau regions to about 800 mm in the western mountainous highland region. To make matters worse,

[31] Christensen et al (2007a). Regional Climate Projections. "*Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change"*, Solomon, S., Quin, D., Manning, M., Chen, Z., Marquis, M., Averyt, K.B., Tignor, M. and Miller, H.L. (eds.), Cambridge University Press, Cambridge.

[32] Pal, J.S., Giorgi, F., Bi, X. et al. 2007. RegCM3 and RegCNET: Regional climate modeling for the developing world. Bulletin of the American Meteorological Society, 88, 1395-1409.

the precipitation distribution of Yemen is characterized by seasonally intense and short-lived heavy storms that produce more flash floods, interspersed with long dry periods—leading to widespread drought. Very recently on October 25, 2008[33], flash floods have claimed the lives of more than 100 persons and left more than 20,000 without shelter in the Hadhramout and Al-Maharah governorates. Groundwater is being mined at an alarming rate—depleted at more than four times the recharge rate in major aquifers, including the Sana'a basin aquifer.

With additional consequences induced due to climate change impacts (such as changes in precipitation distribution and watershed hydrology, increased intensity and hotter climate, and more frequent drought), water stress and sometimes also flooding are likely to get worse. Consequently, mainstreaming adaptation measures into the overall development strategy of the country including at national, regional, sectoral, and project levels is imperative. However, successful integration of climate risk information within development programs will depend on a number of factors, not least is access to high-quality meteorological data to characterize present climate variability; credible climate change scenarios at the spatial and temporal scales needed to support decision-making; technical capacity to undertake impacts assessment, options appraisal, and adaptation planning; institutional and sectoral structures in place to deliver climate-proofed development programs and projects.

Challenges with regard to climate change projections and downscaling: although good agreements are normally available amongst the IPCC models for temperature change predictions, there is no clear consensus about the sign of the projected changes in rainfall for Yemen. Historical climate variability also is prevalent in Yemen in both space and time and the trend of precipitation is inconclusive for the country as a whole—there are wetter trends in some parts of the country and drier trends in others. Also, due to brevity of climate change data and lack of systematic data collection, and availability of climate data in pieces and patches with various institutions, including the Civil Aviation and Meteorological Authority (CAMA), the national Water Resources Authority (NWRA), the Ministry of Agriculture and Irrigation (MAI), and the Geological Services under the Ministry of Oil and Minerals, understanding climate variability and change, and also climate change downscaling continues to be a challenge in Yemen.

Moreover, downscaling efforts in order to operationalize climate change impacts in space and time has mixed results for Yemen because of lack of historical understanding of climate distribution, and partly also due to lack of consensus on the magnitude and trend of changes in precipitation. The level of uncertainty among model predictions, especially for extreme events that are so important for resilience against climate change impacts, is another challenge to operationalize climate change impacts in Yemen.

a. ***Establish a centralized, national institution/authority responsible for environmental data collation***, quality assurance, reporting and dissemination. Data under this category include, among others, hydro-meteorological data, physiographic data, agricultural data, and socio-economic data. Such data authority should have a working relationship (e.g., an MoU that is enforceable) among various institutions that collect environmental data today, including NWRA, MAI, EPA, CAMA, and YRSC where these institutions continue to collect data but share those data with the national authority for environmental data repository. There is already an ongoing effort, for example, by BGR to establish a national water resources database by bringing together NWRA, GSMRB, and MAI with the possibility to connect to the databases of CAMA and YRSC. Such efforts could be supported and further expanded with a TA support for capacity building in data collation, quality control and analysis, and dissemination. To maximize impact and transparency, data would ideally be accessible via the internet in near real-time. All data should be available free of charge for legitimate users, including government agencies, research institutes, and partner organizations. A business

[33] Reported on the CNN news website @ http://edition.cnn.com/2008/WORLD/meast/10/25/yemen.flooding/index.html

plan over a 20-50 year time horizon should be prepared with a view to sustaining such authority. In due course, the data assets would become an integral part of Yemen's adaptive management and research effort.

b. ***Undertake high-resolution, topographic surveys of Yemen's coastal zone*** to establish baseline data and to determine those sites that are most vulnerable to projected changes in extreme tidal levels (when combining sea level rise, tidal cycles, surges and waves). For example, Light Detection and Ranging (LIDAR) is an airborne technology that uses lasers to map the distance of surfaces or habitats with accuracies of a few centimeters. This level of accuracy is needed to resolve the impacts of projected sea level rise (which is generally expected to be of the order 1 meter or less by the end of the 21st century).

c. Related to "b" above, ***install, maintain and disseminate data for tidal gauges*** located at strategically meaningful locations along Yemen's coast. Tidal data for Aden are available from 1879 to 1969, but discontinuously thereafter. A few short records are available for less than a hand of other sites. Despite the length of Yemen's coastline, sufficient information could probably be gathered from a network of just 3-4 tidal gauges.

d. Devise a workable system and ***implement stringent planning controls to direct future development away from vulnerable sites*** (especially in the coastal zone and river drainage network). Current regulations require that all new development be set back 300 meters from the high-tide level, but this requirement is not being adhered to (e.g., plans for Aden 2025[34]). Where developments are occurring in vulnerable places, costs and pathways of adaptation should be explicitly built into the project plan from outset.

e. ***Devise contingency plans and social protection mechanisms for reducing the impact of long-term rise and shocks in global food prices driven by climate change***. Note that food security is potentially affected by extreme weather events in major food producing regions, as well as by international attempts to mitigate climate change (e.g., replacing food with bio-fuel crops). Even under the most optimistic scenarios for domestic food production, Yemen remains reliant on food imports (especially non-meat products), so this fact should be the starting point for long-term planning.

f. Related to "e" above, ***quantify the virtual water flow into and out of Yemen***. This information could be used to monitor long-term trends in the "balance of water payments" and provide evidence to help restructure the economy, or incentivize activities that generate more "profit per drop". For example, there are probably more profitable water uses than exporting livestock fattened on irrigated pastures. Clearly, any restructuring or incentivization should be motivated by the dual aspirations of diversifying livelihoods, and reducing poverty and malnutrition.

[34] http://www.yobserver.com/front-page/10017567.html

Appendix 6: Partial list of climate related activities implemented in Yemen by development partners.

Year	Project / Plan	Donor	Aims / Results
2009-2012	Yemen Flood Disaster Rehabilitation project	WB Grant	To contribute in rehabilitation and reconstruction of physical assets in Roads and Agriculture Hadhramout and Al-Maharah governorates aftermath of the devastating flood of October 2008
1996-2009	Tai'z Flood Protection	WB/IDA Credit	To prevent Tai'z city from excessive and frequent flood through building lined cannels and staling basins upstream, within the city and downstream the city
1996-2000	Emergency Flood Rehabilitation project	WB/IDA Credit	To help in rehabilitation of damaged assets aftermath the devastating flood took place in 1996 and hit Marib, Hadhramout and Abyan Governorates
2003-2010	Urban Water and Sanitation project	WB/IDA Credit	To provide water and sanitation to a number of Yemen cities
ongoing	Sector-wide environmental and social impact assessment (SWESIA) for the water sector	The Netherlands, WBG	Sectoral S&EIA
2009-2014	Water Sector Support Program	GOY, WB, Dutch, German (KfW, GTZ)	This multi-financed program is going to deal with water issues (Water Resources, Water Supply and Sanitation and Irrigation) and related issues in a holistic manner. The program is going to implement some activities included in the National Water Sector Support Strategy and Implementation Plan (NWSSIP).
Ongoing	NWSSIP and its latest updates	GOY and donor groups	National water sector strategy
2004-2011	Ground and Water Conservation	IDA Credit	To increase groundwater and surface water irrigation efficiency through providing PVC conveyance and pressurized localized irrigation systems and building surface irrigation infrastructure. In addition, the project introduced Irrigation Advisory Services and Water Community Management.
2001-2007	Irrigation Improvement Project	IDA Credit	Rehabilitate and Improve Irrigation Networks in Wadi Zabid in Hodeidah Governorate and Wadi Tuban Lahj Governorate and establishment of Water User Associations (WUA) and Irrigation Councils (ICs) and transfer Irrigation Management of Secondary and Tertiary Canals to these organization
2003-2010	Sana'a Basin Water Management	IDA Credit	To pilot on Integrated Water Management in Sana'a Basin and create Sana'a Basin Management Commission with representation of Government, Local Council, WUAs, Agri. Cooperatives and Private sector to manage water resources and water use in Sana'a Basin.

16	Netherlands climate assistance program (NCAP)—study	The Netherlands	Looked at the implications of CC on water availability in three basins
17	National strategy to combat desertification	UNDP, FAO, UNCCD	looked at the level and rate of desertification in Yemen, and outlined the strategy to combat such challenges
18	National disaster management strategy	GEF	Developed a strategy to manage disaster
Ongoing	Sustainable NRM project (Phases I & II)	GEF	
ongoing	Economic diversification project	UNDP	Looking at options in the promising sectors
Ongoing	Biodiversity conservation of protected areas	GTZ	Looking at conservation of protected areas along the coast of the Arabian Sea
Ongoing	Yemen Integrated Coastal Zone Management Project	WB	
Ongoing	Rain-fed Areas and Livestock Project	WB	
Ongoing	Integrated urban development project	WB	Improve urban-rural interface and resource sharing
2006 - 2010	FRMCP: Fisheries Resources Management and Conservation Project	WB Credit/EU Grant	Three components: a) assess the capacities of the Ministry of Fish Wealth to manage the fisheries and the quality of fish, and help reorganizing the ministry; b) rehabilitate the big fishing harbors, build jetties, and new auction areas along the coastline; and c) undertake stock assessments and prepare fisheries management plans.
2006 - (ongoing)	PCDP: Port Cities Development Programme	WB Credit	Economic enhancement and infrastructure development for investment in the three main ports Aden, Mukalla and Hodeidah..
2005 - 2007	NCSA: National Capacity Self-	GEF/UNDP	Identify and determine the nature of capacity constraints faced by the country to respond to the global conventions,

	Assessment		and describe ways to address these constraints.
2007 - 2014	Al-Dhala'a Community Resources Management Project	IFAD Loan	Achievement of logistic and sustainable development for rural livelihood levels and insures life access for poor family.
2004 - 2009	Groundwater and Soil Conservation Project	IDA Credit	Improve water use efficiency, and increase ground and surface water levels through watershed management.
2004 - 2008	National Capacity Building for Natural Resources Management	UNDP	Strengthen the performance of environmental protection and national poverty alleviation policies, to build capacities of central and local level institutions on integration of environmental and sustainability issues within the district development process, to enhance awareness at the local and policy making levels and to promote sustainable livelihood approaches in management of natural resources including establishment of nature reserves. Established and supported the management of the Aden Wetlands Protected Area, and supported implementation of Bura'a and Hawf Protected Areas.
2004 - 2007	National Capacity Building for Natural Resources Management	UNDP	Support environmental management both at upstream and downstream levels.
2004 - 2007	Decentralization and Local Development Support Programme (YEM/03/008)	UNDP	A pilot intervention, which is/was to develop into a major program to support the national strategy for the implementation of decentralization reforms.
2004	GEF SGP: GEF Small Grant Programme	GEF/UNDP	Deliver global environmental benefits in the area of biodiversity conservation, climate change mitigation, protection of international waters, prevention of land degradation (primarily desertification and deforestation), and elimination of persistent organic pollutants through community based approaches.
2003/07 - 2008/12	SCDP: Sustainable Development and Biodiversity Conservation for the People of Socotra Islands, various consecutive phases	UNDP-Netherlands-Italy (multiple phases)	Support human development for the people of Socotra islands, through the conservation and sustainable use of its unique biodiversity and natural resources. The program gives equal weight to biodiversity conservation requirements and developments of Socotra, through supporting the main engines of growth for the local economy, addressing most pressing basic community development needs and enhancing the professional capacities of the local government to pave the path of sustainable development.

	(YEM/03/004)		
2003 - 2008	ESDIP: Environment and Sustainable Development Investment Programme	Yemen Gov.	The plan presents an outline strategy and priority interventions aimed at controlling and gradually reversing environmental impacts. It also aims at supporting sustainable human development for the people of Yemen.
2003 - 2007	Assistance to the Government of Yemen to Coordinate and Monitor Implementation of Poverty Reduction Initiatives (YEM/03/001)	UNDP	Incorporating environmental assessment, social participation and the consideration of sustainability issues into poverty reduction strategies.
2003 - 2005	PRSP: The Poverty Reduction Strategy Paper	Yemen Gov.	The plan reinforces sustainable management of natural resources, mobilizes beneficiaries, involves the poor and supports the role of women and youth in environmental conservation.
2003 - 2004	NAPA: National Adaptation Programme of Action (YEM/03/G37)	GEF/UNDP	Broadly communicate to the international community priority activities that address Yemen's urgent needs for adapting to the adverse impacts of climate change.
2003	NPA: National Plan of Action for the Protection of the Marine Environment from Land Based Activities	EPA/UNEP	Assess and identify land-based activities and sources of pollutants. Major issues effecting Marine and Coastal areas were identified and prioritized, and a plan of action prepared.
2002 - 2007	Fisheries Monitoring and Surveillance	European Commission	The aim was to establish a sustainable and cost-effective fisheries monitoring and control system (MCS) within the Ministry of Fish Wealth.
2002 - 2005	National Recovery and Recycling Programme for Refrigerators in the Commercial and MAC Sectors in Yemen (YEM02\G61)	GEF/UNEP	Implement a comprehensive national program for recovery and recycling of refrigerants in the refrigeration and air-conditioning sub-sectors according to the refrigerant management plan.
2002 - 2005	CCF: Country Cooperation	UNDP	Provide sustainable natural resources management and promote the integration of environmental management with

	Framework		national development policies and programs.
2001 - 2010	Al-Maharah Rural Development Project	IFAD Loan	Support rural communities' self-development, enhance family income, promote suitable use of available natural resources, improve social infrastructure and services, and Increase local capacities.
2001 - 2005	PAM/CZM: Protected Areas and Coastal Zone Management Project: CZM Pilot Project.	GEF/WB	Prepare baseline study on the marine biodiversity, and develop CZM and PAP plans for the two CZ pilot areas Sharma-Jethmun, and Bir Ali-Balhaf and two PA protected area in Jabal Bura'a in Hodeidah Governorate and In Jabal Hawf in Al-Maharah Governorate; with intensive consultation with the communities and related stakeholders. Besides, a series of related reports, maps, and guidelines were produced.
1992 – 1998	Land and Water Conservation project	WB/ IDA Credit	To increase groundwater and surface water irrigation efficiency through providing PVC conveyance and pressurized localized irrigation systems and building surface irrigation infrastructure.
1997 - 2004	Protection of the Marine Ecosystems of the Red Sea Coast Yemen, several phases (YEM/97/G32)	GEF/UNDP	To protect the marine ecosystems of the Yemeni Red Sea coast, including coral reefs and other critical habitats, which are important to fisheries and to maintaining high biodiversity, thereby assisting Yemen in achieving sustainable use of the marine resources in the area.
1997 - 2004	NBSAP: National Biodiversity Strategy and Action Plan (YEM/96/G31)	GEF/UNDP	Assist the government in development of a national biodiversity strategy and action plan.
1997 - 2002	Socotra Biodiversity Project	GEF/UNDP	Conduct baseline terrestrial and marine biodiversity, habitat, and ecosystem surveys, identify priority conservation issues, develop comprehensive zoning and conservation management plans, establish protected areas, implement monitoring programs, and pave the way for a long-term management of Socotra (see SCDP, 2003-2008).
1997 - 2001	INC: Initial National Communication under the United Nations Framework Convention on Climate Change	GEF/UNDP	Presented the initial assessments of Republic of Yemen situation in implementing the UNFCCC. Estimated the GHG in Yemen, assessed different climate scenarios and their potential impact to critical sectors (e.g. CZM, Agriculture and water Sectors).
1996 - 2000	NEAP: National Environmental Action Plan	Yemen Gov.	Promote sustainable use of natural resources through a set of policy options in addressing priority issues.

Appendix 7: Priority investments identified in NAPA[35]

1	Develop and implement Integrated Coastal Zone Management programmes
2	Water conservation through reuse of treated waste water and grey water from mosques, and irrigation saving techniques.
3	Develop and implement an awareness raising programme on adaptation to the potential impacts of climate change.
4	Establish and maintain database for climate change and adaptation
5	Planting and re-planting of mangroves and palms for adaptation to projected sea level rise
6	Develop and implement programs to improve Yemen's preparedness to cope with extreme weather events
7	Rainwater harvesting through various techniques including traditional methods..
8	Rehabilitation and maintenance of mountainous terraces.
9	Promotion of research on drought resistant and heat- and salinity- tolerant crops.
10	Design and implement sustainable land management strategies to combat desertification and land degradation
11	Sustainable management of fisheries resources.
12	Incorporation of climate change and adaptation to school education

[35] From: http://unfccc.int/resource/docs/napa/yem01.pdf

Annex 8 Translation of Cabinet Decree on Organization and establishment of the IMCCC

Cabinet Decree No. 349 for the Year 2009

On

Approval of Regulation on Organizing and Establishing High Committee for Climate Change

Cabinet has reviewed the memorandum presented by H.E. Deputy Prime Minister for Economic Affairs , Minister of Planning & International Cooperation No. (1/5/) dated on 11/01/2009 regarding establishment of High Committee for Climate Change. Cabinet reviewed and decided to:

1. Approve the regulation on establishing the High Committee for Climate Change with the following modifications:

    - Consolidate articles (3,4) and rephrase them in one article
    - Add a new item(No. 4) to article 10 stipulating any other related tasks in addition to mentioning the location of the committee
    - Rephrase article 11 to state location for technical secretary and add a new item(No. 4) to clause (b) stating (**any other related tasks**)
    - Add a new sentence to the end of article (14) stipulating (**in consistency with effective rules and regulations**)
    - Add Minister of Oil as a member of the committee

2. Minister of Water and Environment and Minister of Legal Affairs shall reformulate the regulation draft in the light of aforementioned modifications and follow up with necessary legal procedures.

3. Decree comes into force as of 11/10/2009

4. Decree to be implemented through appropriate administrative tools

Reserved	Rejected	Implemented	
No	No	Main	Member
		Deputy Prime Minister Minister of Planning & International Cooperation	In-line Ministers

Decree Period: Permanent
Content of Degree: Service/ Water and Environment- Regulation on Organizing and Establishing High Committee for Climate Change
Form of degree: regulation
Execution Agency: Joint

Appendix 9: Matrix of possible institutional setups

PPCR Requirement:

- **Scale up action and transformational change.**
- **Shift from business as usual, sector by sector, and project by project approaches.**
- **Promote a participatory approach to achieve climate resilience at the national level in the medium and long term.**

Provide inclusive platform for all development partners.

	Experience with climate change (CC)	**Capacity (human and institutional)**	**Pros**	**Cons**	**Recommendation**
Min. of Planning	-Some: Member of the steering committee of the NAPA. -Chair activities such as Food Security Program. -Leads development planning (although currently CC is not included).	-Strong institutional capacity and mandate. -Current limited human capacity and resources in the area of climate change. CC may be an extra burden.	-Oversight of all gov. development activities. -Mandate of international coordination with donors. -Can facilitate mainstreaming CC within the overall development planning. -Lead the fourth 5-year plan for social and economic plan for poverty reduction (within which CC resilience should be mainstreamed). -May create permanent and sustainable institutional capacity; a requirement for PPCR.	- Need support for successful coordination and oversight of various activities including CC. -No human and financial capacity. -Limited hand-on experience with CC adaptation especially going forward to the second stage of PPCR. -A coordinating agency. -Lacks mandate for project implementation.	Option dropped due to information in columns 2-5.
PIU	??- Depends on management and staff selected.	-Insufficient institutional capacity and mandate (not long term sustainability of building capacity).	-Flexible set up including hiring and attracting skilled staff. -Implementation may be faster and easier than a setup without a PIU.	-Will not create sustainable institutional capacity (no long-term sustainability of building capacity in relevant sectors). This is a requirement	-Option dropped due to information in column 2-5.

				for the PPCR. - Mainstreaming CC within the overall development planning will be a challenge.	
Agriculture and fisheries production promotion Fund	-No experience with CC.	-Lacks capacity for sound climate change activities.	-Have adequate resources and experience with management of financial resources. -Can provide funding for CC adaption.	-Not an implementing agency. -Need support for successful implementation of the PPCR. -No human capacity and experience with CC.	-Option dropped due to information in column 2-5. -Can complement external financing for CC
EPA	-Adequate experience: 15 years+ experience with CC including: 1st National Communication on CC and NAPA. The latter is the base for the PPCR. -Has mandate in GOY and it is in charge of preparation and implementation of national and international climate related activities and treaties. -Focal point for UNFCCC and Kyoto Protocol. -Coordination mechanism though: permanent committees, consultation processes , and maintain national team with	-Has CC unit that has become a general directorate. -Has worked with national and international experts and houses a roster.	-The government entity in charge of environment and CC activities. -Currently working on CC. -Working relationship in CC with donors. -Do not focus on one sector but work with all sectors towards achieving sustainable development. -Has adequate capacity and experience with CC. -Proved successful in producing cross-sectoral NAPA, including consultations with majority ministries and civil society down to the Governorate and local levels. -UNFCCC focal point. -Have a system for national and local	-Despite mandate, it has limited coordination and implementation capacity.	-Option can be selected subject to adequate technical and financial resources being provided. -EPA can start immediately.

	representatives from universities and research institutions, governments, etc. on CC.		consultation in place. -May create permanent and sustainable institutional capacity; a requirement for PPCR. -has branches across Governorates.		

APPENDIX 10: A three-pronged approach to reducing social vulnerability to climate change

Successfully addressing social vulnerabilities to climate change requires action and commitment at multiple levels (adapted from Verner (2009)). In a three-pronged approach, appendix offers key operational recommendations for strengthening the commitment and broadening the scope of climate change adaptation at the government, community, and household levels. Emphasis is placed on enhancing good governance and technical capacity in the public sector, building social capital in local communities, and protecting the asset base of poor households.

(1) Enhance good governance and technical capacity in the public sector

At the government level, specific attention should be paid to building both the institutional and human capacity to better identify and address the needs of populations highly vulnerable to the effects of climate change. By strengthening the institutions and infrastructure designed to respond to rapid-onset and slow-onset climate-related disasters, along with enhancing the human capital involved, the government is better equipped to play a key role in protecting citizens and their assets as well as the country's recent development gains and future prospects.

- ✓ Better targeting of populations at risk is critical to addressing the needs of those who are the most vulnerable. While different groups may be equally exposed to natural hazards, they are not equally impacted. Vulnerability is as much a function of socioeconomic indicators as of biophysical exposure, and as such resilience to climate change varies between and within communities. The unequal distribution of vulnerability to disasters within and across communities is visible even at the household level. This means that interventions to help people adapt to the effects of climate change and rebuild following a disaster need to focus not just on areas and numbers of people at risk, but on who is at risk, and the types of risk they face. One promising approach is the development of climate indicators applied to conditional cash transfer programs.

- ✓ Strengthening governance and responsiveness in the public sector is required especially to address the needs of the most vulnerable groups. These groups often suffer disproportionately from weak and unresponsive public institutions. One key aspect concerns governments' disaster preparedness. While many community-driven adaptation projects are successful in building local resilience, there is an urgent need to scale up best practices. The necessary institutional framework for developing and implementing such initiatives is often lacking. It is therefore important to promote a synergistic relationship between vulnerable groups and both formal and informal state and local institutions, thereby developing the linking social capital required for more equitable access to local, national, and international institutions and their resources. Another key aspect of effective responsiveness relates to innovation in financial products that give social protection for climate-change-affected households and communities. Elaborated in more detail in the section on financial capital below, these products enhance the policy options available for local and national governments to help families rebuild their livelihoods after a natural disaster. Finally, an equally critical aspect of good governance is related to slow-onset disasters, such as increasing water scarcity. What is often needed is a comprehensive strategy to build technical capacity across key public actors, especially to enhance the ability to integrate climate change aspects into sectoral approaches such as integrated water resource management. By analyzing the institutional integration of, for example, water issues and the impact of climate change on water resources in different areas of government, it is possible to identify what gaps need to be filled in human resource skills, technical capacity, and organizational processes. International donors can support this learning process to improve governance and facilitate improved decentralization and development of partnerships.

- ✓ Infrastructure must be developed that is designed to withstand climate-induced tension, such as increased soil erosion or mudslides, to secure emergency access, and to protect health and assets. Building lasting physical infrastructure is a fundamental element in any national and local adaptation plan and is essential to fulfilling the above objectives of reaching the target groups and delivering an effective response. Given the scarcity of resources, the urgency of the matter, and the longevity of large-scale infrastructure projects, the donors can effectively incorporate participatory climate adaptation into projects in water and sanitation, roads and bridges, and electricity - whether these are already in progress or in the pipeline.

(2) Develop social capital in local communities: voice, representation, and accountability

The ways in which individuals and groups within a community interact with each other constitute the community's social capital and influence how vulnerable a community is to climate shocks and variability. While often overlooked or underestimated, social assets provide the foundation that allows other assets to be generated and allocated appropriately. Just like any other asset, social assets are often too weak to withstand the pressure of a natural disaster, which may unravel the bonds that hold a community together and allow for risk sharing, mutual assistance, and collective action. However, social capital can also be used to build resilience that may enable a community to strengthen its response to climate change. This is effectively done by empowering people and the community itself, drawing on local knowledge, and encouraging local participation.

- ✓ People and communities should be empowered to lend voice not only to their challenges, but also their solutions. The augmented Sustainable Livelihoods Framework, with a particular focus on social capital, is helpful as the basis for planning, because when applied to a given setting, the findings provide an understanding of which groups are vulnerable and why; to what extent they can rely on their relatives, neighbors, and government agencies as a coping mechanism; which assets will provide the greatest resilience and adaptive capacity; and how the needs are likely to evolve over time. Community-based risk-assessment projects are valuable for their ability to involve local participation in adaptation while helping to create social capital. Local institutions can provide communities with a forum to voice their concern, and seek representation and accountability, because they function as facilitators for households and social groups to inform, design, and implement adaptation practices. However, for local institutions to play an effective role, strong institutional ties with the national government are required to ensure a continued exchange of information. For example, incorporating the data and knowledge collected at the local level into regional and national adaptation strategies is contingent on the integration of power down through the system while keeping governance efficient.

- ✓ Drawing on local knowledge and institutions in designing adaptation measures is essential to achieving sustainable adaptation. The findings in this volume repeatedly emphasize the importance of actions that are conceived and executed locally, using area-based, decentralized approaches to enhancing resilience where livelihoods are irrevocably changed. Social capital is essential to facilitate this kind of representation of local interests and knowledge, yet it is also an outcome of this process. While tensions between different types of social capital can develop, often in rural and traditional settings, the goal is to address underinvestment in social assets by regenerating bonding social capital among stakeholders at the local level.

- ✓ Involving local stakeholders in adaptation initiatives is a practical means to increase institutional and project accountability while building the local asset base. At the institutional level, local civil society organizations can play a key role in tracking the allocation of funding for adaptation projects at the regional and local level. At the project level, retraining local agents to fill jobs in project management and field monitoring and evaluation can provide a safety net in promoting climate-resilient jobs while working towards reducing community risk to climate change. While this holds potential for strengthening the physical and financial capital of those whose livelihoods are threatened by climate change, it will also build the social capital needed for communities to voice and represent their own interests, and for national institutions to be more responsive to and accountable for the needs of local communities.

3) Build household resilience through asset based adaptation: a no-regrets approach

People living in poverty are particularly vulnerable to the erosion of their asset base. During a sudden decline in assets, such as during a climate-related disaster, poor households often cannot achieve even low consumption levels without having to deplete productive assets even further, whether these are livestock, family health, or children's education. Hence, building the asset base of the poor is a no-regrets approach to good adaptation while working towards local development goals.

As part of an asset-based vulnerability analysis, it is helpful to distinguish between the asset protection needed during a natural disaster and the asset building needed to withstand projected long-term gradual climate changes. Different constellations of assets are needed during different stages of a climate-change impact: before, during, in the immediate aftermath, and for long-term recovery and adaptation. For instance, investment in early warning

systems and training are crucial elements of enhancing livelihood resilience, whereas financial capital, such as credit or insurance, is vital for recovery and long-term adaptation. Interventions should focus on enhancing the specific mix of livelihood assets that will provide the greatest resilience and adaptation given the local climate-related vulnerability context.

APPENDIX 11: Minutes of the Second Meeting of the IMCCC

In the name of God the Merciful

23 Nov, 2009

The Higher Committee for Climate Changes
(Second) Meeting Agenda

Contents:

- Discussion and approval of the last meeting's minutes.
- Presenting the four options for the climate changes program.
- Discussion on the proposed agenda of the higher committee during the coming period.
- Review of the feedback raised on the Regulation of the Council of Ministers Decree No. (349), dated 10th of November 2009.

Proposed agenda for the higher committee during the coming period

- Review of the amendments, comments and additions for the draft Regulation in accordance with the Council of Ministers Decree No. (349) For 2009.
- Coordination with the Minster of Legal Affairs to follow up the completion of all procedures needed for the final approval of the Regulation based on the amended draft in accordance with the Council of Ministers Decree No. (349) For 2009.
- Determination of the regular meetings times for the committee. It is proposed that the committee is to conduct its meeting on quarterly basis. A call for emergency meetings is the responsibility of the Head of the Committee, when ever is required.
- Review of the proposed mandate for the technical committee and the committee's secretariat (attached).
- Take decision on the formation of the technical committee from related technical agencies, with classification of the representation level, and authorization for the technical secretariat to start its work.
- Assigning the technical committee and the secretariat to develop their action plan for 2010, with determination of the technical and financial needs.
- Approval of the technical committee's action plan for 2010.
- In each meeting, the committee should review the activities implemented by the technical committee during the quarter based on the approved action plan, as well as review of activities implemented by other agencies related to the climate changes.
- Approval of proposals regarding the integration process of the climate changes issues existing in different sectors' policies, strategies and plans for the socioeconomic development and poverty reduction.
- Supervision n the preparation of the climate changes adaptation program in all phases.

Proposal for the formation and mandate of the technical committee for climate changes

The Higher Committee for Climate Changes will form a technical committee with the membership of representatives of:

- Ministry of Water and Environment – Environment Protection Authority
- Water Resources Authority
- Ministry of Agriculture & Irrigation – Agricultural Research & Guidance Authority
- Ministry of Fishery - Marine Sciences & Aquatic Animals Researches Authority
- Ministry of Transport – Civil Avian & Meteorology Authority (meteorology sector)
- Ministry of Telecommunications & IT - Remote Sensing Center
- Ministry of Oil &Minerals – Geological Survey & Mineral Resources Authority
- Ministry of Public Health & Population
- Ministry of Higher Education & Scientific Research
- Ministry of Social Affairs & Labor
- Central Statistics Organization
- Commercial & Industrial Chambers Union

The Technical Committee is expected to:

1. Create a clear and flexible coordination mechanism for continuous communication and information exchange in issues related to climate change among different sectors through representatives in the technical committee.
2. Data collection from different related sectors for analysis, update, and documentation proposes to be utilized in the preparation of the climate changes adaptation program as well as in the establishment of the comprehensive and consolidated database for all related sectors covering all climate changes areas.
3. Review studies and reports on activities related to climate change in related sectors, as well as submission of proposals and recommendations to the Higher Committee for approval.
4. Preparation of proposals on the integration process for climate changes issues included in different sectors' policies, strategies and plans for the socioeconomic development and poverty reduction.
5. Submission of technical, institutional and legal recommendations, grounded on data analysis, regarding the proposed actions to adapt to the climate changes in related sectors, to the Higher Committee to help for better decision making.
6. Decide on the best utilization of existing expertise in related sectors, if required.
7. Undertake any other activities to be assigned by the Higher Committee.

Committee Secretariat

A technical secretariat performs as vocal point for communications on the UN's Framework Convention & Kyoto protocol based in the Environment Protection Authority, will assist, follow up and coordinate for the Higher Committee and the Technical Committee in the following tasks and activities:

1. Coordination of activities for the Higher Committee and the Technical Committee.
2. Preparation of meetings for the Higher Committee and the Technical Committee.
3. Preparation of all required documents for both the Higher Committee and the Technical Committee.
4. Preparation of the meetings' minutes for both the Higher Committee and the Technical Committee.

5. Communication with agencies relevant to the climate change and sharing with them the decisions and recommendations made by the Higher Committee and the Technical Committee.
6. Follow up the implementation of the recommendations made by the Higher Committee and the Technical Committee in other related sectors.
7. Establishment of an integrated database in order to document and update information on the decisions, activities and recommendations made by the Higher Committee and the Technical Committee in addition to reports related to climate changes in other sectors.
8. Undertake any other activities to be assigned by the Higher Committee and the Technical Committee.

- Regular meetings of and the Technical Committee are to be conducted on monthly basis, or earlier when required.

Council of Ministers Draft Decree No. (349) For 2009, concerning approval of the draft The Regulation Organizing Tasks of the Higher Committee for Climate Changes.

The Prime Minister,
Having perused

- The Constitution of the Republic of Yemen;
- Law No. (26) For the year 1995, concerning Protection of the Environment;
- Law No. (8) For the year 2007, concerning formation of the Cabinet; as amended by Law No. (105) For the year 2007 and its amendments For the year 2008;
- The Republican Decree No. (101) For the year 2005, concerning the establishment of Environment Protection Authority;
- The Council of Ministers Decree No. (124) For the year 2009, concerning approval of the National Document for Adaptation to Climate Changes;

And, based on proposal submitted by the Minister of Water & Environment and the Deputy Prime Minister, Minister of Planning & International Cooperation.

After Approval of the Council of Ministers;

Resolved the following

Chapter One

The Definitions

Article (1): This Regulation shall be called "The Regulation Organizing Tasks of the Higher Committee for Climate Changes."

Article (1): For purposes of application of this Regulation, the expressions and phrases mentioned below will be intended to mean the following significations, unless the context indicates otherwise:

Republic: The Republic of Yemen

The Ministry: The Ministry of Water & Environment.

The Minister: The Minister of Water & Environment.

Committee Chairman: The Chairman of the Higher Committee for Climate Changes>

The Authority: The Public Environment Protection Authority.

The Chairman of the Authority: The Chairman of the Public Environment Protection Authority.

The Higher Committee: The competent Higher Committee responsible for climate changes issues regulated by the UN Climate Change Framework Convention approved by Law No. (3) For 1995, and Kyoto protocol attached to the convention approved by Law No (32) for the year 2004.

Competent Authority: Any Ministry, authority or institution performing specific activities related to climate changes.

The Convention: UN Climate Change Framework Convention.

Kyoto protocol: Kyoto protocol attached to the UN Climate Change Framework Convention.

Climate change: A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

Sustainable Development: A development that meets the needs of the present times with no damage to the requirements of the future generations.

Chapter Two

Principles & Objectives

Article (3): The main goal for this Decree is to:

a. Assist the Republic of Yemen in achieving a sustainable development through utilization of funding opportunities and mechanisms available through the Conventions; contribute in achieving the final objective of the Convention in the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.
b. Guarantee the implementation and achievement of activities and projects contributing to the achievement of sustainable development in the Republic of Yemen.
c. Cooperation and coordination among different competent agencies in the Republic in the preparation and implementation of climate changes related activities.

Chapter Three

Establishment of the Higher Committee and its tasks

Article (4): A Climate Change Higher Committee shall be established as follows:

1.	Deputy Prime Minister, Minister of Planning & International Cooperation	**Chairman**
2.	Minister of Water and Environment	**Vice Chairman**
3.	Minister of Agriculture & Irrigation	**Member**
4.	Minister of Fishery	**Member**
5.	Minister of Finance	**Member**
6.	Minister of Transport	**Member**
7.	Minister of Telecommunications & IT	**Member**
8.	Minister of Oil &Minerals	**Member**
9.	Vice Minister of Local Administration	**Member**
10.	Deputy Minister of Planning & International Cooperation	**Member**
11.	Chairman of Public Environment Protection Authority	**Member**
12.	Chairman of Public Water Resources Authority	**Member**

Article (6): The Climate Change Higher Committee will be responsible for application of the provisions of the Regulation, provision in other related Laws in force, international conventions and protocols endorsed by the Republic of Yemen.

Article (7): The Climate Change Higher Committee will conduct the following tasks:

1. Supervision on climate changes related activities and programs;
2. Coordination of climate changes related activities and guarantee their integration with activities in different sectors;
3. Inclusion of climate changes related issues in the national strategies and plans, as well as in the sectoral strategies and plans;
4. Review and approval of projects and programs annual documents in the climate changes area;
5. Conduct monitoring and evaluation for activities and programs in the climate changes area;
6. Coordination and cooperation with donor states and organizations regarding climate changes related activities and programs

Article (8): The Climate Change Higher Committee shall prepare detailed internal regulations and rules related to implementation of its tasks.

Article (9): The Climate Change Higher Committee shall submit an annual report to the cabinet on activities related to projects with green development mechanisms.

Chapter Four

The Technical Committee

Article (10): The Climate Changes Higher Committee will form a technical committee with membership of representatives of related agencies to tasks such as, and not exclusive to:

1. Preparation of technical reports and documents regarding climate changes related activities in different sectors;
2. Study and review reports and documents regarding climate changes related activities, and submission of proposal and recommendations to the Climate Changes Higher Committee for approval;
3. Data collection from different related sectors be utilized in the preparation and implementation of the climate changes adaptation programs and activities;
4. Undertake any other activities to be assigned by the Higher Committee.

Chapter Five

The Committee Secretariat

Article (11): A technical secretariat performs as vocal point for communications on the UN Climate Changes Framework Convention, to be based in the Environment Protection Authority. This secretariat shall assist, follow up and coordinate for the Committee in the following tasks and activities:

1. Coordination of daily activities for the Committee and the Technical Committee;
2. Preparation of meetings for the Higher Committee and the Technical Committee;
3. Communication with all agencies related to climate changes;
4. Undertake any other activities to be assigned by the Higher Committee.

Chapter Six

General Provisions

Article (13): The Climate Changes Higher Committee shall follow a complete transparency, including dissemination of all procedures, decisions and annual reports related to climate changes activities, projects and programs.

Article (14): The Chairman of Climate Changes Higher Committee shall approve all other regulations, rules and decisions to be made for the propose of application the provisions of this Regulation, to be issued after approval by the Committee, without prejudices to the provisions of the provisions Laws in force.

Article (56): This law is effective as of its issuing date, to be published in the official gazette.

Issued in the Presidency of the Council of Ministers.
Dated ……. A.H. (, 2009)

AbduRahman Fadhl Al-Iriany — **Minister of Water & Environment**

Dr. Ali Mujauar — **Prime Minister.**

APPENDIX 12: List of Participants to Joint CC Impacts and Adaptation Workshop, 15-17 November 2009

List of Participants to Joint CC Impacts and Adaptation Workshop, 15th November 2009

No	Name	Title	Organization	Phone No
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7	Dr. Khaled Khanbari	Deputy Chairman	Yemen Remote Sensing Center	777234731
8	Mohammed Shamsan	DG, Environmental Policies & Planning	MWE	777718878
9	Dr. Abdo A. Al-Makaleh	Deputy Chairman	CAMA	733725232
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11	Dr. Mansoor Al-Aqel	DG, Agricultural Extension	Agriculture Extension, MAI	733417777
12	Nabil Noman	Journalist	Al Thwrah News Paper	777584322
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23	Fahmi Bin Shabraq	CC unit	EPA	
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25	Dr. Saif Ali Al-Hakimi		Faculty of Science, Sana'a University	771813628
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34	Sharif Motawe	Program Officer	IFC/World Bank	
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36	Ayoub Almahab	GIS Specialist, GD	MAI	714028003
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40	Dr. Mohammed Alakhali		Ministry of Health and Population	77757127
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45	Mohammed Al-Shaibani		NWRA	733246994
46	Saleem Abdo AlBari		NWRA	733818521
47	Mahmoud Sulatan		NWRA	777310810
48	Amal Al-Huseini	Manager,	Our Life Society (Culture& Environment)	777333137
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50	Faisal Nagi		SNC	733692609

51	Gawid Jailani		Social Development Funds	
52	Abdu Rahaman Saeed Shuraim	Chairman	Supporters of Environment Society (Sheher, Hadramout)	734450256
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54	Fatth Mojors	Political Officer	US Embassy	7352398
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59	Prof. Abdulla Babaqi	Head of WEC	WEC	777300883
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75	Dr. Mohammed Abu Baker	Lecturer	University of Sana'a	733760025
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77	Garry Charlier	MNSSD	World Bank	2024735676
78	Naji Abu-Hatim	Sr. Rural development specialist	World Bank	
79	Johanne Holten	DPO	World bank	
80	Gamal Al-Harrani	Consultant,	World Bank	711002109
81	Nagwan Sharhan	Program assistant	World Bank	
82	Benson Ateng	Country manager	World Bank	
83	Luis Constantino	Sector manager	World Bank	
84	Bekele Debele	Water resources specialist	World bank	
85	Kanta Kumari	Sr. Natural resources management specialist	World bank	
86	Zuzana Tolrianova	Program officer	UNDP	712222332
87	Fuad Ali Al Kadasi	Team Leader of pro-poor economic growth	UNDP	712222330
88	Mr. Selva Ramachandran	Country Director	UNDP	448605
89	Bohdana Rambourkova	Communication officer	UNDP	711336628
90	Abdoulkader Qudoum Abdallah	Advisor	Advisor to the Minister of Ministry of Environment, Djibouti	
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List of Participants to Joint CC Impacts and Adaptation Workshop, 16th November 2009

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