PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE

Report No.: AB3068

Project Name	Yemen: Adaptation to Climate Change using Agrobiodiversity Resources in the Rainfed Highlands of Yemen
Region	MIDDLE EAST AND NORTH AFRICA
Sector	Crops (60%); General agriculture, fishing and forestry sector (40%)
Project ID	P103922
GEF Focal Area	Climate change
Borrower(s)	REPUBLIC OF YEMEN
Implementing Agency	
Environment Category	[ ] A [X] B [] C [ ] FI [ ] TBD (to be determined)
Date PID Prepared	May 23, 2007
Estimated Date of Appraisal Authorization	July 2, 2008
Estimated Date of Board Approval	October 6, 2008

1. Key development issues and rationale for Bank involvement

Yemen's economy, the poorest among the Arabian Peninsula countries, relies mostly on agriculture which contributes more than 15% to GDP and employs more than 55% of the active population. Poverty is widespread in the rural areas, home to 83% of the poor, who derive their livelihoods and incomes exclusively from agriculture and agriculture-related activities. Rainfed agriculture in the highlands represents more than half of the total cultivated area of Yemen.

Climate change is a real concern for Yemen. Most climate modeling scenarios indicate that the drylands of West Asia and North Africa will be the most affected by droughts and high temperatures in the years to come. A greater frequency of droughts and flash floods has already been observed in recent years. Rainfed agricultural areas are the most vulnerable to the impact of climate change. Lower rainfall, a consequence of climate change, would have immediate detrimental impacts on rain-based agricultural systems. One study estimates that climate change could lead up to 50% reduction of crop yields for rain-based agricultural crops by 2020 (Agoumi, 2003).

The communities in the highlands in Yemen retain important agrobiodiversity and traditional knowledge related to the utilization of their agrobiodiversity resources. Yemen is well known for its agrobiodiversity based on the large number of landraces of barley, wheat, sorghum, millet, lentil, and cowpea which have evolved over more than two thousand years, and for the construction and management of terraces which help minimize land degradation and improve water use efficiency. A large number of landraces of different crops are still used within the prevailing and diverse farm systems to meet the food needs of these communities and those of their livestock. Most of these landraces have accumulated adaptive attributes for coping

with the adverse environmental and climatic conditions and to the need of local communities. This invaluable agrobiodiversity should be conserved, both *in-situ* (on-farm) and *ex-situ* (genebanks), as it provides an important genetic base for crop improvement programs, specifically for the development of crop varieties which are likely to be better adapted to impending shifts in climatic patterns.

Adaptation to climate change entails a process of building a country's adaptive capacity to respond and adjust to climate variability and extremes by increasing its ability to moderate potential damages, take advantage of new opportunities due to climate change and cope with the consequences of the adverse effects. To achieve optimum adaptation on the ground, it is critical to downscale regional and global predictive climate models and develop vulnerability profiles, at the appropriate scale, for these communities.. This localised information and prediction models would ensure that appropriate coping mechanisms are mobilised through improved extension delivery systems to the farming communinities.

Both agrobiodiversity conservation and adaptation to climatic changes have been identified as issues of importance to the country by Yemen's Ministry of Water and Environment, the Ministry of Agriculture and Irrigation, the Agricultural Research and Extension Authority (AREA), Yemeni Genetic Resources Center (YGRC) and other research and development institutions, including universities (Sanaa University and others) and some local NGOs (Yemeni Association for the Development of Sustainable Agriculture (YASDA) and an international NGO (Iddeales). This priority is evident in two recent initiatives in the country:

(i) Yemen recently completed its National Adaptation Plan of Action. This proposed project will directly target the top two of the four articulated priorities in the Plan, namely: 1. Improving community resilience to climate change through the development of sustainable rural livelihoods; and 2. Improving agricultural production under erratic rains and changing climatic conditions.

(ii) The Government's Rural Development and Agricultural Development strategies not only stress the importance of agriculture as the driving force for development in the highlands of Yemen, but also the need to take advantage of local agrobiodiversity and local knowledge to prevent further land degradation and to help farmers adapt to climate change.

This proposed GEF project is closely linked to the World Bank financed 'Rainfed Agricultural and Livestock Project' (RALP) which focuses on highland agriculture and has a component to promote community-based seed increase of landraces of field crops. This project will supplement the RALP through research and pilot projects in areas that address the global aspects of adaptation to climate change and conservation and utilization of agrobiodiversity resources. The RALP will help provide continuity to implement the findings of the GEF project, as well as a stronger institutionalized connection with the counterpart agencies, which will be crucial for the sustainability of the GEF-financed project.

In cooperation with international and regional organizations, Yemen has developed over the years, a strong partnership with ICARDA through the implementation of several research projects, including some which focused on the preserving local agrobiodiversity and improving the productivity of traditional farming systems.

While Yemen has some technical expertise related to the conservation of plant genetic resources, including *in-situ* and *ex-situ* collections, it has no capacity to link agrobiodiversity resources and conservation with coping mechanisms for communities to adapt to climate change through predictive modeling. This project provides an opportunity to fill critical gaps of information and propose coping mechanisms which will be mainstreamed directly through the World Bank-financed RALP project.

2. Proposed objective(s)

The Project Objective is to enhance coping strategies for adaptation to climate change for farmers who rely on rainfed agriculture in the Yemen highlands, through the conservation and utilization of biodiversity important to agriculture (particularly the local land races and their wild relatives) and associated local traditional knowledge.

In terms of its overall strategic approach, the project seeks to integrate adaptation to climate change with the conservation and utilization of agrobiodiversity resources by:

(i) bringing together local/traditional knowledge, particularly that of female farmers, with modern farming techniques and practices;
(ii) developing vulnerability profiles at the appropriate (community/district/governorate) level for target species/varieties, and
(iii) developing adequate and appropriate coping mechanisms as well as policy, institutional and technology options

3. Preliminary description

This project will be financed through GEF: it is anticipated that the project would receive about $ 4 million from the GEF, and would reflect the relevant components of the RALP project as co-financing (of about $ 3 million). Collaboration and co-financing amounting to about $ 300,000 is expected from ICARDA.

The following project components are being considered:

Component 1: Agrobiodiversity and local knowledge assessment (US$ 400,000)
Field inventories and documentation of agrobiodiversity resources and the traditional farming systems and local knowledge, including the farmers' preferred crop species (local landraces) and their adaptive characteristics to cope with changes in climatic conditions. Particular attention will be given to ensure inclusion of female farmers who are the custodians of much of the indigenous knowledge.
Outcome: Vulnerability profiles of landraces/varieties developed as a result of better knowledge of on-farm presence of local agrobiodiversity and its climate adaptive characteristics..

Component 2. Climate modeling assessment (US$ 500,000)
An assessment of current meteorological data and weather monitoring centers, capacity and institutional assessment in Yemen with regards to historical climatic data and the

development of early warning systems. This would be coupled with the application/adaptation of regional and global climate prediction models to improve local predictive capacity and the development of vulnerability profiles for individual province/governorate. These localised information and prediction models would ensure that appropriate coping mechanisms are introduced through improved extension delivery systems to the farming communinities.
Outcome: Initial local predictive capacity of climatic changes developed and installed.

Component 3. Development and implementation of coping mechanisms options. (US$ 2,200,000)
A range of coping mechanisms (such as *in-situ* conservation, improved terracing with soil and water conservation practices, choice of crops and cropping patterns) will be developed and implemented on a pilot basis to help reduce farmers' vulnerability to future climate shocks and shifts. These will be tested against vulnerability profiles and early warning systems. This component will be caried out in close coordination with the RALP project and with particular attention to inclusion of female farmers.
Outcome: Coping mechanisms to improve the resilience of local communities to future climate change piloted at select sites.

Component 4. Enabling policies, institutional and capacity development (US$ 700,000)
A review of institutional capacity at local and national level to mainstream agrobiodiversity and climate change adaptation agendas into national policy and programs.
Outcome: Improved capacity of key agencies and stakeholders to promote adaptive measures to climate change and support the conservation and sustainable use of local agrobiodiversity, including the passage of policies and legislations by government to enable this.

4. Safeguard policies that might apply

[Guideline: Refer to section 5 of the PCN. Which safeguard policies might apply to the project and in what ways? What actions might be needed during project preparation to assess safeguard issues and prepare to mitigate them?]

The Task Team suggests that the project be processed as a Safeguard category B, with a partial EA. The project may trigger OP 4.01 (Environmental Assessment) and OP 4.09 (Pest Management). No physical works are proposed and it is unlikely that OP 4.12 (Resettlement policy) will be triggered.

5. Tentative financing

Source:	($m.)
BORROWER/RECIPIENT	
IDA	3.00
Global Environment Facility (GEF)	4.00
PHRD – Climate Change Window	
ICARDA	0.30
Total	7.30

6. Contact point

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