



# Consultative Group on International Agricultural Research (CGIAR)

## Media Backgrounder

*Eighth International Conference on Dryland Development:*

*Human and Nature—Working Together for Sustainable Development in Dry Lands*

*25-28 February 2006, Beijing, China*

## CGIAR's Role in Combating Desertification

Desertification is a complex phenomenon, adversely affecting the lives and livelihoods of over 2 billion people living in drylands that cover 40 percent of the earth's surface. Desertification hits the poor people hardest, especially those who depend on agriculture for their livelihoods. Desertification ranks among the greatest global environmental challenges today, and it is a major impediment to meeting basic human needs in dryland areas.

The United Nations Convention to Combat Desertification defines desertification as “land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities.” Currently, 179 countries have signed the Convention ([www.unccd.org](http://www.unccd.org)).

Recognizing the severity of the problem and the long-term threat posed by desertification, the United Nations declared 2006 as the “International Year of Deserts and Desertification.”

At its core, desertification is about land degradation, which decreases agricultural productivity, reduces biodiversity, and degrades the environment, while diminishing ecosystem resilience. Caused by a combination of human-induced factors and climate change, desertification creates economic, environmental, and social hardship for millions of poor farmers who practice subsistence agriculture in fragile environments.

Contrary to the myth and imagery of advancing deserts encroaching whole cities, desertification is a long-term process that renders land unsuitable for crop and livestock production. Scientists point out that while fluctuation in the supply of ecosystem services of drylands is normal, desertification results from the persistent reduction in all levels of ecosystem services over extended periods. Desertification occurs on all continents except Antarctica, and globally, some 10 to 20 percent of drylands are already degraded. Problems of land degradation are most severe in Sub-Saharan Africa, North Africa, Southeast and West Asia, and Latin America. According to the Millennium Ecosystem Assessment, if left unchecked, desertification and degradation of ecosystem services in drylands will impede future improvements in human well-being.

For more than 35 years, CGIAR scientists and partners have been harnessing global knowledge to combat desertification and ameliorate its negative impacts on food, nutrition, and income security of poor people, while promoting the sustainable management of natural resources such as biodiversity, forests, soils, and water. Working within a public goods framework, CGIAR scientists and partners are developing a range of new agricultural technologies and fostering improved policies that address the multifaceted challenges posed by desertification.

These science-based efforts are yielding results in the form of hardy food and feed crops that are better suited for harsh climates in desertification-prone regions of the world, farming techniques that make more prudent use of natural resources in ecologically-fragile areas where subsistence agriculture is the norm, and fostering improved policies that help poor people to cope with the challenges posed by desertification.

CGIAR strategies to fight desertification are in tune with international efforts, including the United Nations Convention to Combat Desertification (UNCCD), Convention on Biological Diversity (CBD), and United Nations Framework Convention on Climate Change (UNFCCC). CGIAR is represented on the Facilitation Committee of the Global Mechanism of UNCCD. Specifically, the Desertification, Drought, Poverty and Agriculture (DDPA) project is a multi-country, multi-institution effort that brings together seven CGIAR Centers and partners to mobilize food and environmental science for sustainable development of dryland areas.

### **Research-based success stories**

***Increasing crop productivity:*** Increasing the productivity of small farms in marginal environments – through new, high-yielding, stress- and disease-resistant food and feed crops – is a fundamental objective of the CGIAR research.

- Barley is an important staple food for poor people living in high altitude, low rainfall areas including the Horn of Africa. In the dry areas of West Asia and North Africa, barley is a key crop to feed small ruminants (sheep and goats), on which the livelihoods of pastoralists depend. By exploiting the trait of drought tolerance in *Hordeum spontaneum*, a wild relative of barley, ICARDA scientists have developed new types of barley that yield 7 to 50 percent more than local landraces.
- NERICAs – the New Rices for Africa developed by Africa Rice Center are suited to the harsh growing conditions common in Sub-Saharan Africa. NERICAs combine the high-productivity traits of Asian rice varieties with the ruggedness of native African rice varieties. It is estimated that more than 130,000 ha are planted to NERICAs across sub-Saharan Africa, and their use is spreading. Improved productivity is helping rice-growing countries to cut food import bills.
- New cassava varieties (tropical manioc selection) developed by IITA are achieving on-farm yield gains of 40 percent in Ghana and Nigeria, even without the use of costly fertilizers.
- CIMMYT researchers and partners have developed Quality protein maize (QPM) with twice the amount of essential amino acids such as lysine and tryptophan. QPM cultivation is expanding, and helping combat child malnutrition in 25 countries.

**Protecting natural resources:** Biodiversity, forests, livestock, soils, and water are the biophysical foundations of agriculture, and protecting them is vital for a productive agriculture.

- By expanding cactus cultivation in North Africa, ICARDA scientists are helping poor farmers to increase their incomes while generating additional sources of feed for animals, preventing wind erosion and stabilizing sand dunes. Research at ICARDA has also shown that a cubic meter of water can produce several times the current levels by adopting efficient water-management techniques. In supplemental irrigation, limited amount of water applied to rainfed crops during critical stages results in substantial improvement in yield and water-use efficiency. Adoption of deficit irrigation increases water productivity and saves water to irrigate additional land.
- New techniques developed by ICRISAT, including applying small amounts of fertilizer, or micro-dosing, are increasing grain yields by 30 to 50 percent in West Africa. Such techniques are promoting more affordable, efficient and environmentally-safe ways to use small amounts of fertilizer for raising and stabilizing yields
- Improved agroforestry practices developed by the World Agroforestry Centre are helping regenerate nutrient-depleted soils in East Africa, while the watershed programs are reducing soil loss and increasing cropping intensity.
- In an innovative program, IPGRI and partners are working to conserve biodiversity and stem genetic erosion caused by drought and desertification in African drylands. One valuable technique uses the seed fair, pioneered in Zimbabwe in the early 1990s. These are events, organized by the local community, often with the help of IPGRI and NGOs, at which farmers bring samples of the varieties they grow, to display and swap. The emphasis is on diversity, not perfection or abundance, with prizes for the most diverse displays rather than the finest crops.

**Fostering improved policies:** Knowledge-brokering, policy dialogue and consultation are key elements of the CGIAR efforts to combat desertification. CGIAR social scientists recognize that local knowledge and locally-adapted coping strategies are vital for equipping poor people to meet the challenges of recurrent drought and desertification.

- IFPRI researchers looking at ways to improve resource management in three drought-prone countries — Burkina Faso, Ethiopia, and Niger — analyzed the links between risk and the kinds of property rights that best provide the mobility necessary to raise livestock in drought areas. Among other conclusions, they found that when herders are able to cooperate more on resource management, grazing pressure on home resources is significantly reduced, and that greater cooperation leads to smaller herds and increased mobility. These findings provide valuable insights for policymakers for designing crises mitigation strategies in countries that are signatories to the U.N. Convention to Combat Desertification.

For more information, visit: [www.cgiar.org](http://www.cgiar.org); [www.icarda.org](http://www.icarda.org); [www.icrisat.org](http://www.icrisat.org); [www.cimmyt.org](http://www.cimmyt.org); [www.IITA.org](http://www.IITA.org); [www.warda.cgiar.org](http://www.warda.cgiar.org); [www.worldagroforestry.org](http://www.worldagroforestry.org); [www.iydd.org](http://www.iydd.org); [www.ddpa.net](http://www.ddpa.net)