

# Central and West Asia and North Africa: Challenges and Opportunities

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## Challenges

Our world is going through an unprecedented phase of transition, in which social, political and economic realities are changing. Both human activities and natural disasters are placing earth's ecosystems under severe stress. The dry areas, where the climate is harsh, face a multitude of challenges. In the Central and West Asia and North Africa—CWANA region, which accounts for a major proportion of the world's dry areas, the arable land and agrobiodiversity are being lost to desertification through overgrazing, deforestation, unsustainable agriculture, and industrial activities. Fresh water scarcity in the region is reaching alarming levels. The average annual per capita renewable water supplies in WANA countries is now less than 1500 cubic meters, much below the world average of about 7000 cubic meters. This is expected to fall to less than 700 cubic meters by the year 2025. Jordan faces a severe shortage with current per capita availability of less than 230 cubic meters. It is projected that, by 2025, at least 19 WANA countries will be in the grip of severe water poverty. The threat of global warming continues. Conflict and natural disasters, such as drought, floods, earthquakes and the tsunamis are further destroying natural resources and taking a heavy toll on human life.

The CWANA region is home to some of the poorest and most malnourished people in the world. An estimated 70% of the poverty is found in rural areas although only about 43% of the total population (over one billion) lives there. Cereals provide the largest component of the human diet in the region, while livestock production, often the major income earning activity in marginal areas, is increasingly dependent on supplementary feeding of grain. The region already has the highest level of imports of food grain globally. Demand will rise while regional production will be increasingly affected by water scarcity.

The huge subsidies (about \$350 billion per year) given to OECD farmers and tariffs that limit the access of developing country producers to OECD markets are among the most important international trade issues that affect the rural poor. These subsidies plus export support, and the consequent dumping of cheap products into the markets of developing countries, is disrupting the agricultural sectors in those countries. Thus, market-orientation faces the problem of accessibility. In Central Asia and the Caucasus, challenges arise from structural reforms and economies in transition.

## CWANA Agricultural Research Priorities

Priorities of research for CWANA were assessed through a consultative exercise in 2002, in which NARS leaders from across CWANA, regional and international organizations, regional fora, and several donors participated. The priorities identified include water scarcity, desertification, biodiversity loss and diversification. However, the problem of food shortages, natural resource degradation and conflict in developing countries cannot be fully addressed by international or regional organizations alone. It is as much the responsibility of the governments and the people of developing countries to create conditions conducive to development. A recent study of the economy and agriculture in WANA countries revealed disturbing realities. The average investment on agricultural research for 18 WANA countries was found to be 0.41% of the Gross Domestic Product. This is much below the 1.5% level recommended by the World Bank, European Union, IFPRI and other organizations. There is an urgent need to increase national investments in agricultural research.

## **Opportunities**

The CGIAR centers and NARS firmly believe that agricultural research can make a significant contribution toward alleviating poverty by improving income generation and food security, reducing malnutrition, and protecting the environment in the region. The key lies in devising ways for producers, and especially the poor majority, to gain greater benefits from agriculture. Strategic approaches of agricultural research to alleviate poverty are through (i) improved technologies for increased production and sustainable conservation of natural resources; (ii) diversified farming systems that reduce risk, increase resource-use efficiency, and improve returns to farmers; and (iii) improved vertical integration from producer to consumer.

Advances in scientific knowledge across a broad range of disciplines are required to develop more and better food and fiber products with improved nutritional quality, reduce food and commodity yield losses due to pests and diseases and drought, ensure healthy livestock, promote a sustainable agricultural sector, manage on-farm water use more efficiently, prevent and reverse land degradation and conserve and efficiently manage genetic diversity. Such advances not only include technical aspects, but also embrace new approaches to previously intractable, multi-dimensional problems, which include greater holism, broader stakeholder involvement and alliances, institutional as well as policy aspects, participatory community approaches and livelihoods analysis to identify the determinants of poverty.

For example, billions of cubic meters of rainwater in dry areas is lost every year to evaporation. Research has shown that about half of this could be captured in macro- or micro-catchment systems. Research has also shown that water can be used much more efficiently, through techniques such as supplemental and deficit irrigation. The objective is increased production per unit of water, not per unit of land.

Diversification and intensification of production systems can also help in soil and water conservation. For example, protected agriculture, particularly under low-cost plastic structures, makes efficient use of limited land and water. Conservation tillage (minimum and no tillage systems) can help improve soil quality, conserve moisture, reduce erosion, and improve water-use and energy-use efficiency.

Biotechnologies, including techniques to manipulate DNA, for a more productive, environmentally friendly agriculture have become available. ICARDA, for example, has been successfully using several of the new technologies, including tissue culture and the use of doubled haploids, DNA molecular markers, carbon isotope discrimination, genomics and genetic transformation, to combat the threat of both abiotic and biotic stresses to cereal and legume crops.

Remote sensing and GIS are proving very useful in devising more efficient water-capturing and land management methods. Modeling tools can help in maximizing the water-use efficiency. Expert systems are being increasingly used to support farmers in decision-making.

Harnessing the full benefits of technological innovations, however, will hinge on effective global partnerships in research and on community participation and implementation of the required changes in public policy and trade relations both at national and regional levels, designed to address contemporary development issues, primarily protecting the ecosystems and enhancing their sustainability to support the future population growth, halting global warming, and conserving the available agrobiodiversity.