Drylands in Central and West Asia and North Africa (CWANA)

Stretching from Morocco across the Middle East and deep into Central Asia, the CWANA region encompasses a wide range of agro-ecosystems, including drylands, irrigated areas, rangelands, mountains and deserts. The region has evolved under extreme climatic conditions and as a result of its long history of human occupation and management.

CWANA has a total land area of around 1.7 billion hectares. Of the 34 million hectares of cropland that are irrigated in the region, 11.3 million hectares, or 33 percent, are undergoing some form of degradation. Of the 73 million hectares of cropland that are rainfed, 50 million hectares, or about 68 percent, are considered degraded, along with as much as 85 percent of the rangelands. Altogether, an estimated 45 percent of the region is affected by desertification.

Much land degradation occurs as part of a natural process, but in many areas it is induced by human activities. These include overgrazing of rangelands, land management practices that lead to soil erosion by wind and water, large-scale irrigation resulting in salinization and excessive removal of vegetation, thus diminishing biodiversity. Drought is a frequent threat in the region, where water resources are limited. When drought strikes, crop yields fall, and pastoralists are forced to sell livestock at low prices, since feed and water resources are insufficient to maintain the herds.

Researchers are working on various fronts to find new ways of increasing agricultural productivity in CWANA, while preventing further degradation of its natural resources.

Selected Highlights from Research for Dryland Development

Farmer participation in barley improvement: Barley is the world's fourth most important cereal crop, and drought affects its yields severely. During 2000 in Syria, for example, when rainfall dropped 20 to 30 percent below the long-term average, the crop produced little or no grain in some areas. Nonetheless, at four dry experimental sites, a few barley lines were able to produce grain. Based on these materials, a new drought-tolerant barley variety was developed, with the participation of farmers, through a plant breeding program coordinated by the International Center for Research in the Dry Areas (ICARDA). The economic benefit so far of participatory barley improvement in Algeria, Egypt, Ethiopia, Iraq, Jordan, Morocco, Tunisia and Syria was estimated at about US$91 million in 1997.

Holding back the desert with native fodder shrubs: The drylands of Central and West Asia and North Africa are home to a variety of shrub species, which supply fiber, timber and fuel. ICARDA and its national partners are working to conserve these species, many of which are now endangered. Scientists are also demonstrating how these plants can be used for such purposes as creating windbreaks against erosion, anchoring sand dunes on desert margins and promoting the growth of adjacent food crops.

One especially promising candidate is saltbush, a hardy, drought-tolerant shrub native to the Mediterranean region. In addition to providing a source of protein for sheep, this shrub has been shown in Syria to increases the yield of barley when grown alongside it. And in Morocco saltbush shows similar benefits when intercropped with barley, oats and various fodder species. To facilitate the spread of fodder shrubs, researchers have devised low-cost methods for establishing them.

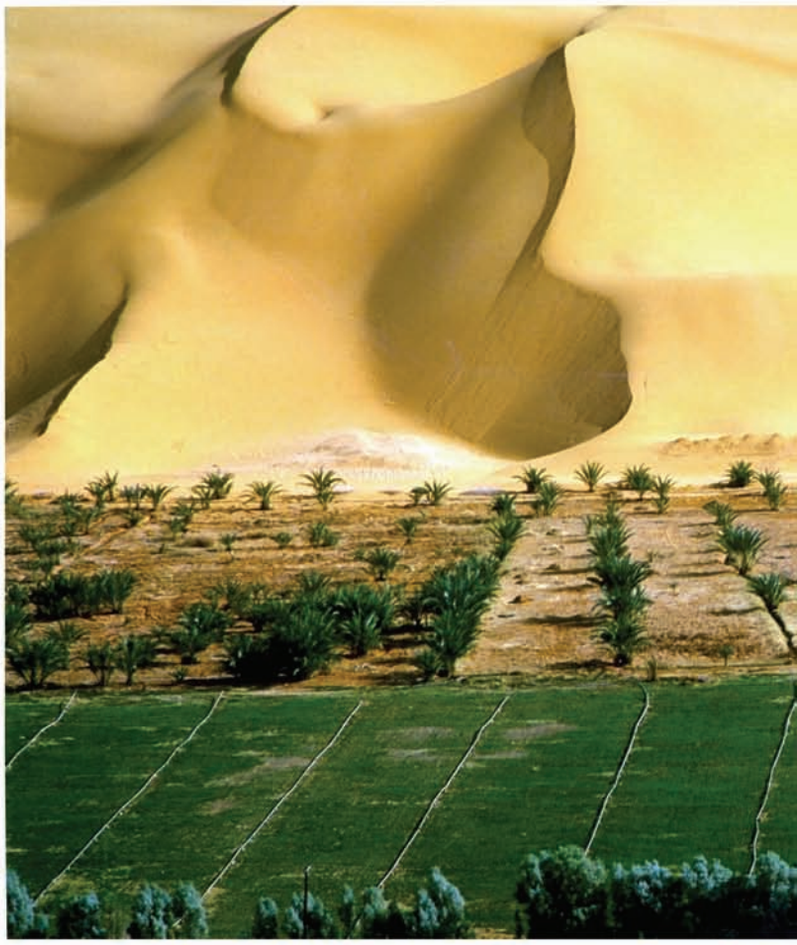
Water harvesting for olive production: One local innovation is enabling farmers in northwestern Syria to grow olive trees sustainably in an area normally considered too dry for this crop, with average rainfall at just 220 millimeters per year.

Traditionally, farmers in this area have used the lower slopes of degraded hills for extensive livestock grazing or barley cultivation. Some of them have managed to establish olive orchards, but their normal practice of plowing up and down the slopes to control weeds results in furrows, which worsen water runoff and erosion. Through participatory research, however, facilitated by scientists from the International Center for Agricultural Research in the Dry Areas (ICARDA), farmers have found that, if they manually form V-shaped earthen bunds, reinforced with stones, around individual trees, the furrows, rather than worsen runoff, actually serve to harvest scarce rainfall. They do so by channeling runoff into the micro-catchments formed by the bunds, where it is concentrated in basins around the trees. The research that led to this innovation is part of a widely applicable, integrated approach for achieving sustainable soil management in dry areas.

Managing drought in the Middle East and North Africa: Given that three-quarters of the arable land in these regions receive less than 400 mm of rainfall annually, virtually no scope exists for further expansion of rainfed farming and very little for irrigation. There is already competition between mechanized cereal production and grazing, and traditional nomadic systems of coping with drought through mobility are becoming difficult to maintain. Moreover, droughts seem to be increasing in frequency, and the high social, economic and environmental costs have led governments to intervene with various forms of assistance to farmers and herders, including distribution of subsidized animal feed.

During a major conference organized by the International Food Policy and Research Institute (IFPRI) and ICARDA, researchers examined the immediate benefits and costs of these measures as well as their longer term impacts on poverty and the environment. Among the conclusions was that, while these programs have reduced catastrophic losses of livestock, continued dependence on them has sent inappropriate signals to farmers and herders, encouraging unsustainable farming practices, while generally benefiting the affluent recipients most.

One innovative idea that emerged from the conference was that of rainfall insurance against catastrophic droughts, coupled with the development of more accurate, timely and accessible early warning drought forecasts. The insurance could eventually be provided by the private sector without subsidies but in its formative stages would require government support. Improved weather forecasts are likely to remain a government responsibility in the immediate future, helping decision makers, relief agencies and farmers prepare for drought more effectively.



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