

2. ICARDA's Outreach Activities

The geographical region covered by ICARDA's mandate includes 32 countries in CWANA, and a number of countries in Latin America. And, although, the expression "dry areas" is used as the common descriptor, it represents a large variety of agro-ecological conditions. For the management of its outreach activities the Centre has established seven regional programmes. These are the following:

- Nile Valley and Red Sea Regional Programme (NVRSRP)
- North Africa Regional Programme (NARP)
- West Asia Regional Programme (WARP)
- Arabian Peninsula Regional Programme (APRP)
- Highlands Regional Programme (HRP)
- Central Asia and the Caucasus Regional Programme (CACRP)
- Latin America Regional Programme (LARP)

The **Nile Valley and Red Sea Regional Programme (NVRSRP)** was ICARDA's first outreach programme. Conceived in 1978 and started in 1979 in Egypt and Sudan as the Nile Valley Project, it was expanded in 1989 to include Ethiopia; Yemen and Eritrea joined the programme in 1995.

The NVRSRP countries have diverse climates, production systems and crops grown. Egypt depends heavily on irrigated agriculture; Sudan has also considerable areas under irrigation. Rain-fed agriculture is more important in Ethiopia, Yemen and Eritrea, with small areas under irrigation. Cool-season cereals and legume crops such as wheat, barley, faba bean, chickpea, lentil, pea, grass-pea and vetches are grown in all the countries. However, warm-season crops are also important; maize and sorghum are extensively grown, millet is produced in all countries except Egypt, and rice is an important crop in Egypt. Livestock production is a major activity in these countries with Ethiopia and Sudan having more than 80% of the total livestock population. Livestock is well integrated into the cropping systems; cattle are the most important, followed by sheep and goats.

The main research thrusts are related to biotic and a-biotic stresses that reduce crop yields and yield stability of the major crops such as wheat, barley, maize, and food and forage legumes. Biotic stresses include rust diseases in cereals and legumes, wilt and root-rot diseases, aphids and viruses, chocolate spot and other foliage diseases of legumes. The major a-biotic stresses include heat, drought and salinity. Recently, more research has been undertaken on natural resource conservation to address soil and water degradation problems.

The involvement of ICARDA in the Maghreb region dates back to 1977. The five countries falling under the **North Africa Regional Programme (NARP)**, Algeria, Libya, Mauritania, Morocco and Tunisia, show similarities, which relate to the geographical and climatic conditions, and their common cultural and historical heritage. However, the sub-region is characterized by a wide diversity of agro-ecologies: Mediterranean, arid, semi-arid and desert ecologies. There are wide variations in altitudes: Atlas Mountains (4165 m), high plateaus and lowlands. Rainfall varies from 1000 mm in the north of Morocco to 50 mm in the deserts in the south. The semi-arid regions, receiving between 200 to 600 mm, dominate

agricultural production. Rangelands cover wide areas and constitute a barrier against the progress of the desert.

Cereal crops, wheat and barley, food legumes, forage crops, and small ruminants constitute the major commodities in the sub-region. They suffer from a variety of biotic and a-biotic stresses. Olive tree groves are grown under rain-fed conditions in most countries. Rangeland rehabilitation and management, and the production of sufficient amounts of animal feed, are a major challenge for all countries. Water scarcity characterizes the region. The impact of climate change is also an important concern. Annual land degradation/desertification is estimated at over 2%. The population continues to grow at a high rate.

ICARDA launched the **West Asia Regional Programme (WARP)** in July 1989 comprising Cyprus, Iraq, Jordan, Lebanon, Palestine, Syria, and the lowlands of Turkey, and established its headquarters in Amman, Jordan. The sub-region suffers from scarcity of water, desertification, biotic and a-biotic stresses for crop production, degradation of natural resources, poverty, especially in rural areas, and difficulties of marketing the surplus of local products. It holds valuable genetic diversity of food and feed species of global importance, but these are seriously threatened by rapid loss. Rain-fed agriculture is predominant; the irrigated areas in Syria and Iraq are starting to suffer from scarcity of water because of depletion of groundwater, along with increased salinity.

Different agro-ecosystems are found in each of the countries, with a predominance of rain-fed agriculture and livestock. The desert and arid ecosystems are characterized by highly degraded rangelands supporting large numbers of sheep and goats. In the semi-arid and high rainfall areas, cereals are most important followed by food legumes. In the mountain areas, fruit tree orchards are predominant with cereals and food legumes. The forests are continuously being degraded by overgrazing and land reclamation for new agricultural land, urbanization, and quarries. Industrial crops such as sugar-beets and cotton are found in the higher rainfall zones and irrigated areas. In a few cases, medicinal plants including cumin and fennel are grown in rotation with cereals. Under irrigated conditions, wheat predominates and the remaining area is used for horticultural, industrial and fruit tree crops along with forages.

The **Highlands Regional Programme (HRP)** was established in 1990 to serve the highland environments of Afghanistan, Iran, Pakistan, Turkey, and the Atlas Mountain region of Algeria and Morocco. The highlands of West and Central Asia and North Africa represent some of the most marginal areas where crops are grown usually under severe biotic and a-biotic constraints.

Productivity in the mountain areas is low and the farming communities are among the poorest. Harsh conditions promote out-migration and land abandonment. Subsistence is obtained mainly from drought resistant crops, such as barley, as well as fruits and vegetables, and from flocks of small ruminants that move to mountain pastures in the summer. Much of agriculture is conducted on sloping land and soil erosion by water run-off is a major problem, especially in areas that have been degraded as a result of overgrazing or inappropriate farming practices.

ICARDA has strived to develop technologies that increase the incomes of the resource-poor farmers of the sub-region. This has been done within the framework of a number of special projects which included among others (i) strengthening Turkey's crop improvement programmes for cereals and legumes in the highlands; (ii) enhancing the technical skills of research staff and agricultural research for dry-land farming in the high altitude areas of Pakistan; and (iii) strengthening of agricultural research in the high altitude areas of Iran.

The **Arabian Peninsula Regional Programme (APRP)** comprises Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE, and parts of Yemen. The sub-region is characterised by extreme aridity and limited renewable water resources. The programme started in 1988 addressing wheat and barley improvement and human resource development. The scope was broadened in 1993 to cover (i) on-farm water use and irrigation management, (ii) a-biotic stresses of heat, drought and salinity, (iii) rangelands, shrubs, irrigated forages and livestock, and (iv) protected agriculture. Rapid economic development in the sub-region during the latter half of the twentieth century has resulted in significant changes in the traditional agricultural systems. Increased production has contributed to economic growth, but has often led to degradation of the natural resources. The issue of water availability and its use is fundamental to the sustainable development of agriculture in the Arabian Peninsula.

The major problems facing the sub-region and on which ICARDA can have an impact are: scarcity of renewable water combined with inefficient use of water; degradation of the large areas of rangeland existing in the region and the resulting desertification; and the need to develop a protected agriculture industry that generates high quality high-value produce with reduced environmental and product contamination by agricultural chemicals.

The **Central Asia and Caucasus Regional Programme (CACRP)** was formally established in 1998, with its headquarters in Tashkent, Uzbekistan. It includes Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Armenia, Azerbaijan and Georgia. The sub-region covers an enormous area of 416 million ha, of which about 275 million ha are rangelands. The climate is characterized by low and variable rainfall and extremes of temperature. The landscape is a mixture of mountains, deserts and steppes.

Traditionally cotton was extensively grown in most of the countries, but this is now replaced by cereals, in particular wheat and, to a lesser extent, food legumes, both under irrigated and rain-fed conditions. In the mountain areas livestock is important; while fruit and vegetable production is expanding to increase income opportunities. Salinity in irrigated areas, erosion on sloping lands, and various biotic stresses are among the major agricultural production constraints

The economic situation of these countries has changed abruptly with the disintegration of the Soviet Union. The newly independent States were obliged to reconsider their individual agricultural production needs because of the unreliability of external supplies and the high cost of importation. Agriculture had to play an important role in the restoration of the national economies and in supplying the population with essential food products.

The CAC sub-region has unique agro-ecological and socio-economic characteristics, and it offers considerable potential for future agricultural growth. There has been uneven progress in transforming the formerly centrally-planned economies into market economies, and the process has had severe consequences in many countries. However, the region has strengths in terms of rich biodiversity of plants and animals, available institutional infrastructure and qualified specialists.

In Latin America there is considerable potential for the effective use of ICARDA inputs and technologies. Faba bean and barley are important crops; natural resource management is a major concern in virtually the whole continent. The **Latin American Regional Programme** (LARP) has established collaborative links with NARS in Bolivia, Chile, Ecuador, Mexico and Peru. Attempts have been made to launch a Latin American Regional Programme with a core-funded Regional Coordinator located at CIP Peru for three years, but so far without success because of lack of donor support. The needs of the Latin American NARS with respect to germplasm of ICARDA's global mandate crops continue to be met through the international nursery programme.