



*SUSTAINABLE LIVELIHOODS IN THE DRYLANDS*

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## **ABBREVIATIONS**

- CCD** United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa
- CGIAR** Consultative Group on International Agricultural Research
- CSD-8** Commission on Sustainable Development, Eighth Session
- ECP** IFAD/NGO Extended Cooperation Programme
- FAO** Food and Agriculture Organization of the United Nations
- IFAD** International Fund for Agricultural Development
- NGO** Non-Governmental Organization
- SPA** Special Programme for Sub-Saharan Countries Affected by Drought and Desertification
- USD** United States Dollar

## OVERVIEW

The development of drylands is a major focus for IFAD as they provide a livelihood for many of the vulnerable rural poor in the world, and because such land resources are under pressure and are readily degradable if sustainable land-use practices are not ensured. IFAD's broad range of investment actions over the last two decades reflects its mandate for poverty alleviation and its concern to promote proper management systems for the croplands, rangelands, water resources and forestry upon which the rural poor and the landless are so dependent. Important related initiatives include the IFAD support for international agricultural research to foster innovative dryland and rangeland practices, as well as IFAD financing for local community management and support systems provided by non-governmental organizations (NGOs). IFAD has acquired specific experience in desertification through two initiatives, namely, the Special Programme for Sub-Saharan African Countries Affected by Drought and Desertification (SPA) (1986-95) and the Global Mechanism of the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (CCD).

This paper highlights the wide spectrum of the relevant loan components of the dryland projects being financed by IFAD, i.e. rainfed cropland, rangeland, small-scale irrigation and low-potential forest, as well as the provision of beneficiary services, which are increasingly important in combating worsening dryland conditions and landlessness. These services focus on areas such as rural infrastructure, rural finance and extension and off-farm income-generation. IFAD's programmes of work and regional priorities for the coming years reflect the organization's commitment to initiatives aimed at drylands and fragile ecosystems and, in particular, its ongoing support for the creation of dryland technologies and for improved local community management of natural resources, with an emphasis on sustainable practices. The major development issues relate to the promotion of greater access to common property resources, especially for women and the landless, and to improved land tenure regimes for the rural poor.

## I. INTRODUCTION

### **Purpose of the Paper**

1. This paper is a forward-looking information and advocacy report about IFAD dryland activities for submission to the Eighth Session of the Commission on Sustainable Development (CSD-8) of April 2000. The paper focuses on the integrated planning and management of land resources, which is a major agricultural theme of the planned session. Dryland development is an important element in the drive for sustainable development as defined by the CSD.

### **CSD Framework**

2. The Rio Declaration on Environment and Development, agreed upon by governments at the 1992 United Nations Conference on Environment and Development, held in Rio de Janeiro, Brazil, states that environmental protection is an integral part of the sustainable development process. It encompasses basic needs and the improvement of living standards in order to enhance the prospects for a more prosperous future for all (Principle 4). From the perspective of meeting basic needs, CSD-8 considers agriculture as an economic sector and identifies the linkages among economic, social and environmental objectives through the concept of sustainable agriculture and rural development. The pace of the average annual decline in the number of undernourished people is still insufficient to meet the 1996 World Food Summit target of a reduction by half in the number of the undernourished by 2015. The need to address food insecurity is intricately linked with the effort to tackle poverty. Improved access to food is a *sine qua non* for sustained progress in poverty eradication. The development of dryland areas characterized by intense poverty must occupy a prominent position within an appropriate and sustainable development strategy, particularly in Africa and Asia.

3. Within the poverty-food security nexus, CSD-8 is specifically highlighting the progress achieved in the integrated planning and management of land resources in sustainable agriculture. IFAD has been closely involved in the CSD-8 preparatory process through its participation in the Maastricht Conference on the Multi-functional Character of Agriculture and Land (September 1999) and through its organization of the Partners' Seminar in South Africa (July 1999). The congruence between IFAD's mandate and the CSD-8 agenda lies in IFAD's significant experience in land management and sustainable agriculture in dryland areas.

### **IFAD's Role**

4. IFAD was established in 1977 as a specialized agency of the United Nations with the unique mandate of combating hunger and rural poverty in low-income, food-deficit developing countries and of improving the livelihoods of the rural poor on a sustainable basis by enhancing food production, nutrition and incomes, as well as by promoting improvements in health and educational standards.
5. Given the concentration of large numbers of rural poor in dry, low-rainfall, or arid areas in Africa, Asia and Latin America, IFAD's support for dryland development is reflected in a high level of investments directed at countries that are characterized by these conditions (see Appendix IV). To date, IFAD's total investment in drylands amounts to almost USD 3 billion. Between June 1994 and the end of 1998, IFAD committed loans valued at USD 497 million for dryland projects out of a total project cost of USD 1.4 billion.
6. IFAD has launched specific initiatives in the area of drylands development. The largest was the SPA, in which IFAD invested some USD 413 million in 29 African countries during the period 1986-95. This was in addition to the regular IFAD lending programme to the same countries over this period, amounting to USD 551 million. In addition, the Belgian Survival Fund Joint Programme, administered by IFAD, provided grants totalling USD 41.5 million during the period 1985-98 for complementary projects or components concerned with health and water supply in nine arid or semi-arid countries.<sup>1</sup>
7. In 1996, IFAD was selected to house the Popular Coalition to Eradicate Hunger and Poverty and, subsequently, the Global Mechanism of the CCD, as outlined later in this paper. In March 1998, it conceived the Special Programme for Asia's Upland Poor. The mandate of the Popular Coalition is to foster agrarian reform and, in particular, to improve land tenure conditions for the rural poor, many of its activities falling within dryland countries. The Special Programme for Asia's Upland Poor constituted an investment proposal for the consideration of the donor community for a regional programme to be directed at the rural poor in the largely semi-arid marginal upland areas of Asia. This would build upon IFAD's substantial experience in upland areas in China, India, Nepal and Pakistan, where the rural poor variously subsist on rainfed agriculture, forest products, or small ruminants grazed on common property resources.

## **II. BACKGROUND**

### **Definition and Characteristics of Drylands**

8. Drylands are generally defined in climatic terms as lands with limited rainfall. Drylands are characterized by low (100-600 mm annually), erratic and highly inconsistent rainfall levels. The main characteristic of *dryness* is the negative balance between annual rainfall and evapotranspiration rates. Rainfall is scarce, unreliable and concentrated during a short rainy season, with the remaining period tending to be relatively dry. High temperatures during the rainy season cause much of the rainfall to be lost in evaporation, and the usual intensity of storms ensures that much of the rainfall runs off in floods. Water is not only meagre in absolute terms, but also scarce for natural and human uses. The characteristics of dryland uses (food production, cash crops,

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<sup>1</sup> Burkina Faso, Chad, Eritrea, Ethiopia, Kenya, Mali, Namibia, Somalia and the United Republic of Tanzania.

range farming, and trees and woodlands), the state of resources and services, and the degree of multi-functionality are summarized in Appendix II.

The traditional typology of the Food and Agriculture Organization of the United Nations (FAO) is based on agroclimatic zones according to the length of the growing period, which is defined as the period when both water and temperature permit crop growth (see below). As defined by FAO, drylands are zones falling between 1-74 and 75-119 growing days, representing arid and semi-arid lands, respectively. Others have adopted a practical working definition of drylands, namely, “anywhere that rainfall is a problem because of amount, distribution and unreliability”.

### **FAO Classification of Drylands**

(Length of growing period in days/year)

1-74	75-119	120-180
Arid	Semi-arid	Dry sub-humid

### **Occurrence of Drylands**

9. Arid, semi-arid and dry sub-humid areas cover 40% of the earth’s land surface. Desertification affects 70% of the world’s drylands, amounting to 3.6 billion ha, or one fourth of the world’s land surface.<sup>2</sup> Asia possesses the largest land area affected by desertification, 71% of which is moderately to severely degraded.<sup>4</sup> For Latin America, this proportion is 75%. In Africa, two thirds of which is desert or drylands, 73% of the agricultural drylands are moderately to severely degraded. With a rate of disappearance of forest cover of 3.7 to 5 million ha per year bearing down on both surface and groundwater resources and with half the continent’s farmland suffering from soil degradation and erosion, Africa is under the greatest desertification threat.

### **Poverty and Land Degradation in Drylands**

10. The poor in ecologically fragile marginal lands are locked into patterns of natural resource degradation. Six million ha of productive land are lost every year, threatening the livelihoods of perhaps a billion people. Land degradation could compel as many as 135 million people – in 110 countries possessing a potential risk – to join the ranks of ‘environmental refugees’. According to the United Nations Environment Programme (UNEP), USD 42 billion is lost each year to desertification globally. The indirect economic and social costs suffered outside the affected areas, in terms of the decline in national food production and the influx of environmental refugees, may be much greater.<sup>3</sup>

11. With over 40% of the population residing on degraded lands, amounting to some 200 million people, and the majority eking out their livelihoods from subsistence agriculture and pastoralism, desertification’s impact is nowhere more striking than in Africa. In sub-Saharan Africa, ‘low-potential’ areas are home to some 103.1 million rural poor, while ‘high-potential’ areas contain 169.8 million rural poor.

### **Common Property Resources**

12. The concept of common property resources in relation to rangeland, low-rainfall forest, or bush and *khans* lands in southern Asia, among other areas, represents an economically rational form of land use under specific conditions of low intrinsic resource productivity. These common lands are used by almost all of the rural population in sub-Saharan Africa and are a central feature of the coping and survival strategies of the poor and the landless. A typical poor rural household will harvest fuel wood for sale, graze whatever animals they have and gather fruit, plant material, medicinal plants, game and building materials for their own use from these lands. The traditional

<sup>2</sup> Drylands: A call to action. Building on IFAD’s Experience: Lessons from Sub-Saharan Africa. IFAD, 23 pp.

<sup>3</sup> Fact Sheet 3, CCD Publicity Folder, May 1999.

customs or practices of the claimant villages or communities normally govern the usage of these common lands. An IFAD initiative has documented these aspects of common property resources<sup>4</sup> and provided an additional basis for subsequent development actions. Cognizant of the importance of the conservation and proper management of these natural resources for stemming rural poverty, IFAD has in recent years financed more projects to boost the management capacities of local communities in this direction.

13. Other issues include regulated access to common property resources, improved access for poor women, strengthened community control and management of common property resources, and improved land tenure arrangements and regimes.

### **III. IFAD INVESTMENT EXPERIENCE AND APPROACHES IN DRYLANDS**

14. IFAD can draw on a wide range of dryland experience, not only from the programmes and programmes included in its loan portfolio but also from special thematic studies, as outlined below.<sup>5</sup> The activities relate to, among others, rangelands, rainfed cropping, small-scale irrigation, land improvements, agroforestry, income-generating activities and farmer support services.
15. In general terms, the possible range of options relating to rangeland and rainfed cropping diminishes markedly as the annual amount of precipitation declines. This can be attributed to farmers' aversion to risk, which is linked to the virtual absence of improved technical production packages for crops under low rainfall conditions. The spectrum of project-financed activities necessarily becomes wider as aridity increases, with increasingly greater emphasis placed on factors such as the provision of civil infrastructure, support services for farmer and rural communities, off-farm income-generating activities and the strengthening of the management and self-help capacities of rural communities and their local institutions. All available irrigation sources are exploited or rehabilitated under a project, but on a rather limited scale. This broad-based approach serves to reduce pressure on the available productive natural resources, which are often degradable and overgrazed. It also mirrors the approach of indigenous societies, which increasingly exploit the multi-purpose nature of their habitats as aridity increases. Hence, 'multi-functionality' can be considered as a traditional response to dryland management.<sup>6</sup>
16. IFAD invested in areas prone to land degradation (arid, semi-arid and dry-sub-humid zones) through a diversity of funding investments, viz. loans and grants (including supplementary funds), long before the CCD came into existence. Activities encompassed agricultural production, natural resource conservation and management, and the creation of alternative livelihoods through, for example, microfinance and microenterprise. There is a strong congruence between desertification control objectives and the objectives of IFAD, namely, poverty alleviation and sustainable development based on innovative partnerships and collective action in dryland areas.
17. Since the entry into force of the CCD, its objectives have been further ingrained in IFAD's lending strategy for Africa, as outlined in the Fund's Programme of Work. The objectives are in line with IFAD's recognition that its most direct contribution to combating desertification and the effects of drought is through enabling frameworks at the local level that allow dryland populations to take a lead role in desertification control.

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<sup>4</sup> IFAD. "Common Property Resources and the Rural Poor in Sub-Saharan Africa". July 1995

<sup>5</sup> Evaluation of the IFAD's Special Programme for Sub-Saharan African Countries affected by Drought and Desertification, Main Report, 1998; the IFAD Eksyst Project Data Base; Thematic Country Studies of Rainfed Agriculture for Sudan, Syria and Morocco [all from the IFAD Office of Evaluation and Studies]; Implementation Project Status Reports, and IFAD Dryland Case Studies from the Partners Seminar on the Multi-functional Character of Agriculture and Land in South Africa, July 1999.

<sup>6</sup> "Multi-functional Character of Drylands", page 6, FAO-Netherlands, July 1999.

18. Experience<sup>7</sup> in the Central Plateau of Burkina Faso is showing that, in situations where the environment is fragile, population pressure strong and agricultural potential weak, effective resource conservation and economic development can only be achieved through integrated multisectoral actions. A more integrated approach is needed in localities where programme components can be combined with balanced land-development plans rather than deployed in a piecemeal and unconnected fashion by various agencies. Such management plans should be drawn up by the rural communities themselves, with the assistance of NGOs and government staff, so that the plans take account of the need constraints and the potential of the communities.

### **Rangelands<sup>8</sup>**

19. Rangelands constitute the most dominant renewable resource in the world's poorest agro-ecological zones. Many drylands are grazed rangelands, and they are used by communities comprising nomads, semi-nomadic pastoralists and semi-sedentary pastoralists in Africa, West Asia and Central Asia. These areas have traditionally been bypassed by national planners and policy-makers. Reckless use, misguided policies, agricultural expansion and urban and infrastructure development have taken their toll on rangeland sustainability. Policy failures tend to limit livestock mobility and foster seasonal dependence on feed inputs. Overgrazing is the most pervasive cause of soil degradation, accounting for 49% of the phenomenon in arid and semi-arid Africa. However, the majority of studies, particularly those of the International Livestock Centre for Africa and the World Bank, as well as research carried out in Sweden, the United Kingdom and the United States, contradicts the perception of UNEP that the grazing areas of the Sahel have been irreversibly degraded.
20. Low-potential areas, marginal lands and drylands, including rangelands, are necessarily a main target for IFAD's project operations. This is because (i) they are home to the majority of the world's poor, including pastoral and migrating communities; and (ii) livestock-raising renders multiple benefits to smallholders both as a source of food and as a coping strategy for low-potential areas. Livestock can even serve as a buffer during civil conflict and natural calamities, as in Burundi, northern Kenya, Mali, Rwanda, Somalia and The Sudan.
21. The water and grazing management regimes of homogeneous groups of pastoral communities have been incorporated into the design of many IFAD projects, as well as in the framing of legislation. These groups are financially, legally and technically empowered. IFAD's operations were undertaken during a time of (a) worsening rangeland degradation around a number of large donor-developed water points; and (b) the disintegration of traditional community resource-management practices in the face of growing government control of such resources. At the same time, there was a sharp increase in the grazing animal population due to supplemental feeding policies favouring large herders and poor farmers. The year-round supplemental feed availability led to vegetative-cover depletion and soil degradation.
22. Between 1978 and 1998, IFAD funded more than 200 projects with livestock components. Most of the projects, particularly those in sub-Saharan Africa, the Near East, North Africa and Central Asia, dealt with the problems of poor range-users. IFAD has consistently involved rangeland-user associations to (i) identify problems and needs; (ii) convey the perceived interests of these associations to local authorities, project designers and donors; (iii) exchange information on appropriate rangeland-management technologies; and (iv) access and manage credit, revolving funds, grazing areas and water points.
23. Within the framework of the SPA, about half the projects served nomadic and transhumant communities, given that small-scale herders are the least well off in times of war and natural

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<sup>7</sup> "Special Programme for Soil and Water Conservation and Agroforestry in the Plateau Central: Mid-term Evaluation Report, 1993", IFAD Office of Evaluation and Studies.

<sup>8</sup> Ahmed Sidahmed, "Rangeland Development for the Rural Poor in the Developing Countries: The Experience of IFAD", IFAD, Technical Advisory Division.

disaster. The SPA provided approaches for (i) restoring the productive capacity of herders and smallholders and rehabilitating infrastructure and services in the aftermath of drought and economic dislocation; and (ii) devising techniques to foster greater resilience during drought and environmental stress through, among other approaches, non-farm income-generating activities and rural enterprises.

24. Although primary investment in rangeland development was limited to only 22 projects (four in West Asia, three in East Africa, three in Asia and 12 in the Near East and North Africa), a large number of projects addressed the needs of rangeland users in various ways through the delivery of inputs, services and credit. One case was the Animal Health Services Rehabilitation Programme in Kenya, which transferred animal husbandry technologies to pastoralists through formal institutions. Some projects were devoted to building state institutions (the Fourth Livestock Development Project in Ethiopia), while others concentrated on building community institutions and on empowering them through training and financing, e.g. the National Livestock Project in Central African Republic. The Stock Route Project in The Sudan sought to establish 'water yards' for the benefit of livestock moving along a 2 000 km track from the rangelands to the markets.
25. Some projects, such as the Western Savannah Project in The Sudan, addressed the constraints faced by a mixed community of nomads and migratory and traditional farmers in terms of improved crop production, development of water yards, provision of veterinary care and dissemination of range management and conservation technologies. Where the overriding issue was access to and control over natural resources, pilot projects aimed at testing community-initiated codes of conduct on the use of resources. Some projects played a catalytic role in the enforcement of range conservation and management legislation, e.g. the Quinghai/Hainan Prefecture Agricultural Development Project in China. The more complex, newer generation of projects attempt to implement integrated solutions to overcome social, economic and technical constraints, for instance, the Livestock and Pasture Development Project in the Eastern Region in Morocco and the Arhangai Rural Poverty Alleviation Project in Mongolia. Some recent projects strive to develop and apply favourable policies, for instance, the National Programme for Rangeland Rehabilitation and Development in Jordan and the Badia Rangelands Development Project in Syria.
26. Two recurring constraints in many projects are (i) feed deficits resulting from a shortage of grazing resources; and (ii) the competition for limited household labour that is responsible for an overemphasis on crop production at the expense of range management and the maintenance of fodder shrubs. IFAD ensures the judicious use of rangelands and other natural resources through the routine inclusion of environmental screening and assessment procedures during project design.

### **Post-crisis Actions**

27. IFAD's intervention strategy in post-crisis situations<sup>9</sup> (man-made or natural disasters, including drought) revolves around (i) the recovery of agricultural productivity among the target group and the relaunch of the rural development process through the supply of seed, fertilizer and other key inputs, community infrastructure rehabilitation and the restocking of livestock; (ii) on- and off-farm income-generating activities based on microcredit and microenterprises; (iii) soil and water conservation in agroforestry initiatives; and (iv) local capacity-building.

### **Restocking**

28. Natural and man-made disasters commonly cause the loss of herds owned by nomadic or migratory pastoralists. This is known as 'destocking'. Oftentimes, the requisite enabling environment has to be created to permit the return of displaced populations. In the aftermath of disasters, restocking aimed at the sustainable replenishment of depleted or lost herds has proved

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<sup>9</sup> "Post-crisis Assistance: The Role of IFAD", pages 12-16, IFAD.

particularly useful in disaster relief and rehabilitation, as illustrated in the Kidal area of Mali (see below). However, restocking must be founded on (i) a detailed understanding of the year-round feed budget; (ii) traditional practices, including formal and informal repayment schemes; and (iii) technical support for privatized animal health care and improved livestock-husbandry, better rangeland management, drought contingency plans as part of early warning systems, training and extension. The Kidal Food and Income Security Programme demonstrates the potential role of project administration in providing post-crisis assistance to displaced people and in conflict prevention.

29. The Kidal area in Mali suffered from two severe droughts, one in 1973 and one in 1984. In 1973, most herders migrated to Kidal, where they rapidly exhausted pastures. During the subsequent drought, in 1984, households that had not migrated had not as yet fully recovered from their herd losses, implying a smaller safety net in the face of the adversities. IFAD's support for the Kidal area, starting in 1986, centred on restoring the regional economy prior to restocking to allow the resettlement of some 30 000 displaced Tuareg pastoralists from Algeria. Some 320 beneficiary associations (including 54 women's associations) were established and received credit for agricultural inputs and vegetable gardens. The success of the approach was due to (i) the strengthening of village institutions and lower-level government bodies with a view to pastoral-community participation in resource management; and (ii) the innovative management practices employed by communities and traditional village institutions to combat soil and range degradation and for the sustainable use and conservation of water.
30. Through other restocking interventions, for instance, in the Central African Republic, Mongolia and Zambia, IFAD realized the value of restocking as part of a long-term development strategy. A number of IFAD projects have involved the distribution of livestock to impoverished herders through cash or in-kind credit.

### **Redressing Range Degradation**

31. The Livestock and Pasture Development Project in the Eastern Region in Morocco provided innovative technical solutions for severely degraded rangelands. Drought-generated land degradation took a severe toll on the sheep-raising community of the semi-arid steppes (grasslands) of Morocco. The establishment of grass-roots cooperatives based on ethnic lineage and ancestral rights over rangeland use served to forge intertribal consensus on the use and improvement of rangelands. Through participation and consensus building, 34 cooperatives were formed within five years, with a total membership of 8 250, including all sedentary, semi-nomadic and nomadic herders over a region of 3 million ha. The cooperatives created two-year reserves on 450 000 ha of previously degraded rangeland on the basis of an acceptable compensation system involving barley and feed concentrate (30 kg barley/ha/annum), which was tantamount to legal recognition of the range users' traditional rights. The plant cover was re-established, and fodder production increased fivefold. The herders, proud of their newfound status, readily paid a grazing fee to cooperatives following the opening-up of each reserve for a brief period. Animal health campaigns, including parasite control and access to drinking water, have reduced livestock mortality, and range users' cooperatives are likely to become increasingly self-reliant. Legal security serves as an incentive for community investment in range management and conservation through labour and resources.
32. Incentives may be indispensable when innovations bring tangible benefits only in the longer term. IFAD has made a distinction between short- and medium-term incentives, namely, food assistance, social infrastructure and services, and long-term incentives such as security of tenure, soil fertility management and agroforestry inputs. Any workable incentive scheme must be based on a thorough understanding among the resource users of the characteristics and constraints of the production system.<sup>10</sup>

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<sup>10</sup> "Resource Conservation or Short-term Food Needs?: Designing Incentives for Natural Resource Management". F. Zaai, M. Laman, C. M. Sourang. International Institute for Environment and Development, London, 15 pp.

33. As evidenced by the SPA evaluation, most projects dealing with soil and water conservation and agroforestry have relied on ‘incentives’ that range from supplying barbed wire fencing, small implements, or complete input packages to carrying out manuring and transporting stone. The effectiveness of subsidies has varied from very good (the soil and water conservation component in Burkina Faso) to very poor (the conservation incentive scheme in Lesotho). In the Niger Special Country Programme, cash and food as incentives were avoided as far as possible to prevent dependency. In general, the projects lacked a strategy to withdraw the incentives either through gradual phase-out or through the transfer of responsibility to permanent financing institutions. For project sustainability, subsidies and other incentives are only temporary measures necessary to sustain the process of adoption to an innovation; their provision should be contingent on an initial display of interest from some beneficiaries in participating in the innovation. The government has the critical role of harmonizing incentives across various stakeholders. Here, IFAD has taken the initiative through the conceptualization of national and local action plans for CCD implementation.

### **Innovative Research**

34. IFAD has provided grant funding to selected research centres under the Consultative Group on International Agricultural Research (CGIAR) for pre-investment adaptive research on: (i) the development of specific sustainable rangeland management technologies through farmer/herder trials; (ii) requisite policy/institutional environments for resource-poor smallholders in North Africa and Western and Central Asia; and (iii) long-term monitoring and evaluation of rangeland resources, e.g. as relating to carbon dioxide fluxes. Some of the specialized CGIAR centres will continue to be significant recipients of IFAD grant financing for the identification of specific technologies for drylands. In addition, IFAD and the Kingdom of Saudi Arabia supported a workshop in 1996 to assess the sustainable use of rangelands in the 21st century.<sup>11</sup>

### **Rainfed Cropland**

35. The sustainable cropping practices used on drylands are directly governed by the low rainfall patterns. Under arid and semi-arid conditions of less than 600 mm of rainfall, the cropping options are greatly constrained by the adverse rainfall-plant consumption relationships. Where rainfall is low and uncertain, the concern of farmers to avoid risk is the determinant, and inputs and outlays in terms of labour and cultivation are kept to levels that are financially sustainable and conform to household food-security needs. Normally, crop choices and cropping sequences only expand when rainfall nears 600 mm per year. In the lower rainfall areas, IFAD’s support for sustainable rainfed-crop development is mostly limited to the introduction of improved seed, tools, machinery services, and extension services to farmers.
36. In this respect, the Moroccan experience in arid areas argues for the introduction of early-maturing varieties, mostly wheat and barley, a closely related adjustment of customary planting and sowing dates, and earlier and better mechanical soil preparation. Crop residues are turned in so as to improve fertility levels and soil structure, while working the soil improves water infiltration and moisture storage, which is further increased by ridging. Weeding is only done by hand, and the weeds are used for stock feed. In these arid conditions, organic manure is the only fertilizer applied, chemical fertilizer being used for wheat in the semi-arid zones. Only farming systems operating at low cost and incurring expenditures mainly for mechanical soil cultivation are reported to be sustainable under these conditions. The essential farmer support services for these systems involve, inter alia, private machinery contractors, larger farmers and the provision of rural finance for farm tools. Land management requires the maintenance of a cover crop on the predominantly shallow soils to contain wind erosion and conserve soil and soil moisture. It is necessary to capitalize on the recent research breakthroughs in the genetic improvement of varieties resistant to dryness, disease and insect attack.

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<sup>11</sup> “Dryland: Sustainable Use of Rangelands”, IFAD Technical Report, 1998.

37. In The Sudan,<sup>12</sup> all three IFAD projects serve environmentally fragile areas that are drought-prone and inherently degradable. The predominant shifting cultivation system in the country is inefficient and cannot even realize the limited production potential. The shortening of the fallow periods, essential to regenerate the fertility of exhausted soils in the absence of fertilizer, manure and legumes, is leading to further degradation. In this context, the thrust of land management commonly is to intensify cropping on existing land and seek to reduce extensification through shifting cultivation. However, intensification holds out limited potential because of: (i) the absence of technical packages specifically for low-potential, rainfed zones; and (ii) traditional farmer attitudes in favour of minimizing outlays for uncertain rainfed farming. Early maturing, drought-resistant and higher-yielding varieties of millet, sorghum and legumes, namely, groundnut, cowpea and pigeon pea, suitable for low-fertility conditions, are an exception. Consequently, the major crop-related project actions are mostly confined to ensuring timely supplies of better quality seed, seedlings, planting materials and tools, together with strengthened extension services. The delivery systems that have proved sustainable relate to the multiplication of such seeds by farmer groups or individuals, which is more cost-effective and responsive than public-sector services. Credit for tools and pesticides for seed dressing are provided by the Cooperative Bank in the En Nahud Cooperative Credit Project, given that free distribution is not sustainable. The use of pest scouting, that is, assessing whether insect attack or pest infestation exceeds a certain critical threshold level, will reduce the use of pesticides to levels that are environmentally desirable.

### **Small-scale Irrigation**

38. Support is increasingly being concentrated on small, simple, low-cost systems, which are mostly gravity-fed and are farmer-initiated and maintained. Emphasis is placed on the rehabilitation of existing facilities and irrigation works (including diversion structures, small earth dams, *karez*s and dug wells) because these are more cost-effective and economical and build on sunken costs rather than on new works requiring relatively higher capital investments. Emphasis is also placed on civil works constructed by farmers or farmer groups involving the same people participating in repairs, contributing labour and materials and maintaining and operating the irrigation works. This approach is more sustainable than reliance on large irrigation structures, which the public sector may have to operate and which in most countries the public sector is seeking to privatize. IFAD has largely de-emphasized irrigation facilities, such as deep tubewells that require regular cash contributions by water user associations for the purchase of fuel and spare parts, inter alia, in favour of small private units, such as shallow tubewells and low-lift pumps, that can be readily installed and operated by an individual or group. IFAD has consistently supported or has sought the introduction or improvement of the management capacity of water user associations (normally one for each facility). These are local community resource-management groups, which are autonomous and have proved to be financially sustainable in the medium term, e.g. the Special Country Programme in Ethiopia, the Upper West Agricultural Development Project and the Upper-East Region Land Conservation and Smallholder Rehabilitation Project, both in Ghana, and the Mara Region Farmers' Initiative Project in the United Republic of Tanzania.

### **Small-scale Land and Water-related Improvements**

39. On-farm and community land works are being financed or supported to improve land capabilities and conserve soil and moisture. The wide range of appropriate, site-specific structures include terracing, contour bounds, soil-conservation works, land levelling, de-rocking, land reclamation, water-harvesting structures, improved water management and windbreaks.

40. Support for soil conservation and erosion-control works was found to be particularly effective in Burkina Faso and had a direct impact on crop productivity in the Special Country Programme for

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<sup>12</sup> This section draws from "The Republic of Sudan: Thematic Study on Rainfed Agriculture", Office of Evaluation and Studies, IFAD Report No. 1021, SD October 1999, and from the "Sudan En Nahud Cooperative Credit Project Internal Evaluation Study", November 1998, Ministry of Agriculture and Forestry.

Niger. As shown in Syria<sup>13</sup> and Mauritius, de-rocking as a land reclamation activity brings handsome economic dividends in spite of the high financial costs, provided that smallholders rather than large landowners are enabled to benefit. Some transfer payments or subsidies are justified.

### **Improved Supplies of Drinking Water**

41. Most dryland projects involve financing for drinking water facilities, which may be surface sources (dugouts, springs, ponds and stream-flow diversions) or which may retrieve groundwater through hand-dug wells, wash bores, or shallow boreholes equipped with hand pumps where possible. In dryland conditions, especially arid or semi-arid areas, the first-time provision or the improvement of supplies of drinking water is usually the most urgent need perceived by rural communities, especially by rural women. Examples include the Southern Federally Administered Tribal Areas Development Project in Pakistan, the En Nahud Cooperative Credit Project in The Sudan, the Special Programme for Soil and Water Conservation, Phases 1 and II in Burkina Faso, and the Food Security Projects I and II in the Northern Guéra in Chad. Gravity systems are more sustainable than systems that require power and mechanical pumps. The provision of water supply facilities benefit women the most, saving time spent on water-carrying; it also breaks the cycle of human disease (mainly gastroenteritis) related to contaminated water. The water facilities are often multi-purpose and may be linked to irrigated vegetable gardens cultivated by women. The impact on household food security is often immediate, and the improvement in human ecology and productivity encourages local groups to introduce or revert to improved land-use practices on their rangelands or village lands. The structures often serve as a focal point around which functional user groups or village groups can, with project support, coalesce or be formed.

### **Agroforestry, Fruit-tree Plantation and Support for Community Natural Resource Management in Mountain and Upland Areas**

42. A wide range of investments involving trees have been financed through IFAD-supported projects in dryland conditions. The focus of the investments includes agroforestry, e.g. the Burkina Faso Special Programme for Soil and Water Conservation; fruit-tree planting, e.g. olive, pistachio and almond trees in projects in Syria; and village or community woodlots. In upland areas in Asia, projects have supported local rural communities in the improved management and control of common forest resources. Matching support covers the establishment of village-run nurseries, training, technical advice on species and site selection, and strengthened extension services. Extension messages about fruit-tree husbandry cover planting, pruning and supplementary watering where possible. The supply of fruit-tree seedlings or grafts by the private sector or by specialized farmer groups through cash sales or other means has proved to be more sustainable and cost-effective than the supply through the operations of public agencies, which must be directly or indirectly subsidized.

### **Matching Components which are not Dryland-Specific**

43. Matching non-dryland-specific components are often financed in IFAD dryland projects in order to boost the impact on beneficiaries. These include rural infrastructure, support for income-generation, rural finance, input supply and marketing.

### **Rural Infrastructure**

44. IFAD experience has shown that a minimum amount of investment in social infrastructure (e.g. roads, tracks, marketplaces, watering points, meeting places and grain and input stores) is necessary for effective rural poverty alleviation. Such civil works have been financed either as integral components, e.g. the Zone Lacustre Development Project in Mali, or occasionally as single project entities, e.g. the Village Infrastructure Programme in Ghana cofinanced with the World Bank. In the Ethiopia Special Country Programme, the absence of investments in roads turned out to be a major constraint. The analysis, planning and implementation required for such

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<sup>13</sup> "Republic of Syria, Thematic Study of Rainfed Agriculture", op. cit. page 56.

investments are normally based on participatory processes. Simple structures are chosen that can be sustained using local materials and skills on a self-help basis so that the local community can assure the subsequent operation, maintenance and repair of the works. The local community would normally participate in the planning and contribute labour and materials for the civil works. Accordingly, the investments are more sustainable because upkeep is assured. Major attention is frequently focused on the repair and rehabilitation of existing, often degraded village-to-farm tracks or trails and farm-to-market roads in preference to larger, more expensive works that would require inputs of specialized equipment and formal budgetary outlays from national agencies.

### **Support for Off-farm Income-generating Activities**

45. In the more marginal or degraded rural environments, off-farm income-generating activities for the rural poor are pursued through skills training and rural finance support. The pressures of rural poverty and the very limited farming possibilities rule out significant gains in incremental income. Alternative income sources have to be identified for the landless, women heads of household and often for poor rural youth as well, who have little or no productive resources, whether cropland or livestock, and whose access to any off-farm income buffer through common property resources may be curtailed or eroded. The diversification of income for the rural poor, as supported by the SPA, is vital to reducing the risks of: (i) cropping from marginal lands and (ii) environmental pressure on erodible or degradable lands, towards more sustainable levels. In the sub-Saharan African context, exceptional population pressures probably render the agricultural sector doubly saturated, necessitating alternative employment through artisanal crafts, petty trading or food processing. In most cases, projects finance rural credit for these activities through a subcontracted local NGO, which provides beneficiaries with the necessary skills training and business orientation and also assists vulnerable groups and poor women in credit-group formation, management and loan recovery. The capacity-building of the NGO is one of the objectives.
46. *Rural financial services.* The adequate provision of rural credit and financial services for poor beneficiaries is central for poverty alleviation and enhanced productivity through the mobilization of family resources, inputs and tools. Rural finance is a necessary back-up for income-generating activities. NGOs are often subcontracted to provide training and credit outreach for individuals and credit associations and to help in the establishment and operation of credit associations (especially among vulnerable groups, including poor women) and in economic recovery. Credit linkages are important for groups active in natural resource management and for the resource-poor, the landless and other vulnerable people who may not have productive resources, such as livestock, or regular access to common property resources, such as rivers and forests. Rural financial services are more viable if they are connected to private commercial banking systems rather than to state-run or single-sector, high-level financial institutions. Another key to sustainability is reliance on lower-level financial intermediaries that serve as the direct providers of credit to rural families, e.g. NGOs, credit associations, merchants and suppliers. The provision of short-term credit has been effective in the En Nahud Cooperative Credit Project in the Sudan, where improved seeds and more crop areas were employed and where the selective use of credit discouraged cropping in marginal low-rainfall areas in favour of intensive grazing by small ruminants.
47. *Improved extension services.* Support for extension services normally covers the retraining of existing staff, inception and in-service training for new staff, mobility and transportation, often field allowances but not salaries, office facilities and incremental operating costs. Increasingly, extension staff is exposed to participatory approaches, including participatory rural appraisals and social forestry, which are central to improved community management of degradable natural resources. Increased attention is being paid to supporting volunteer village-level workers in crop and livestock health because of their closer interaction with poor farmers and because of the greater sustainability of this approach due to its lower demands on public resources.

#### IV. GRANT SUPPORT FOR DRYLAND INNOVATION

48. IFAD's policy thrusts incorporate technology development for fragile ecosystems, including dry zones. Because of the virtual absence of improved crop-specific technology packages and extension messages for the production systems of resource-poor smallholders in low-rainfall areas, IFAD loan finance for investment projects and programmes concerned with dryland development, aside from grant financing by the Belgian Survival Fund Joint Programme, is also complemented by other ongoing IFAD grants, which make a qualitative impact on the nature of dryland development in IFAD member countries. These grants include (i) technical assistance (TA) grants for agricultural research to CGIAR institutions such as the International Centre for Agricultural Research in the Dry Areas, the International Crops Research Institute for the Semi-Arid Tropics and the International Centre for Tropical Agriculture; (ii) TA grants to non-CGIAR institutions; and (iii) NGO/Extended Cooperation Programme grants to NGOs.

##### **Innovative Research for Drylands**

49. The CGIAR system comprises a network of 16 international agricultural research centres (IARCs) supported by governments, foundations and international and regional organizations. This global system is dedicated to increasing agricultural productivity through the application of scientific knowledge. Although it represents only about 4% of the globally allocated funds for agricultural research for the developing world, the achievements of the CGIAR have enhanced growth and productivity in global agriculture, including a quadrupling of grain yields over the past three decades, accomplished mainly through varietal research and building on gains from the emerging revolution in the biological sciences. As much as 44% of IFAD's total grant funding, amounting to USD 131.6 million, has been devoted to agricultural research, the CGIAR and non-CGIAR institutions accounting for approximately 30% and 14%, respectively. It is through such financing and advocacy for selected themes that IFAD has been effective in modifying the global agricultural research agenda in favour of small-scale producers and the rural poor. A 1997 study called on IFAD to incorporate, in addition, socio-economic constraints inhibiting the adoption of known drylands technologies as an integral part of the agricultural research agenda.

IFAD is the only international financial institution that specifically targets its entire research budget on the food crops and livestock commodities traditionally produced by the rural poor, particularly the major cereals in rainfed drylands, which have hitherto been absent from the research agendas of international agricultural research centres.

##### **Research Assessment<sup>14</sup>**

50. A recent IFAD assessment has identified the major research findings of IFAD-supported research programmes that relate to dryland cropping. These are summarized below:
- *Germ plasm enrichment.* Improved varieties of rice; low-rainfall-tolerant, high-yielding varieties of wheat and barley; improved varieties of cassava resistant to cassava mosaic disease; improved disease-resistant varieties of field beans in Central Africa, which take account of anti-nutritional factors and women's preferences in terms of seed colour, size and cooking times; and high-yielding varieties of pigeon peas for poor small farmers in South Asia.
  - *Improved production systems.* Low-input technologies developed for rainfed dry uplands for rice, maize, sorghum, millet, chickpea, pigeon pea and groundnut.
  - *Crop protection.* Integrated pest management practices to combat stem borers, pathogens, nematodes and weeds; a highly successful biological control programme to combat the cassava mealy bug in Africa; prevention measures to contain the menace of desert locust; and success in testing an adapted male-annihilation technique against the carambola fruit fly in the dry north-eastern regions of Latin America.

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<sup>14</sup> Document EB 48/63.6.II, Annex I, Technical Advisory Division, IFAD.

- Other notable dryland-related research successes concern soil fertility and erosion control, for instance through alley farming; animal health; sustainable natural resource management; and the diversification of rural livelihoods. Of particular note are special agroforestry technologies for the Sahel region, including ‘living fences’ and shelterbelts.

### **The NGO/Extended Cooperation Programme**

51. IFAD established the NGO Extended Cooperation Programme in 1987. While IFAD loans constitute the main framework of IFAD’s collaboration with NGOs, the ECP also provides direct grant financing for pilot and experimental activities in order to draw upon NGO knowledge, practices and operational expertise for the design and implementation of ongoing and future IFAD projects. Some 175 NGOs have benefited from ECP grants. In contrast, a total of 486 NGOs have been actively involved in the implementation of IFAD-financed projects in developing countries. The ongoing ECP programme has focused, inter alia, on enhancing the planning and implementation of participatory community development (30% of activities) and testing and disseminating appropriate technologies (29%). Within this framework, it also gives collaborative support to institutions concerned with dryland aspects such as the South African Root Crop Research Network. An important subset of 31 ECP activities, financed in 1999, relates to improved dryland practice and innovation, of which seven examples are described below.
52. The promotion of the participation of the poor in sound and sustainable resource management is one of the aims of the Pilot Participatory Rangelands Management Project in the Badia region of Syria. With ECP support, CARE International will introduce among local Bedouin communities participatory resource assessment and management methods that are aimed at reducing rangeland degradation and achieving the control and sustainable management of resources. This pilot project will also capitalize on the lessons learned during the early stages of the implementation of the Badia Rangelands Development Project.
53. Many of the poorest and most marginalized people in Asia, the vast majority of whom are indigenous peoples, live in semi-arid hilly and mountainous areas with few livelihood alternatives other than shifting cultivation. Given the negative ecological effects of slash-and-burn agriculture, identifying and disseminating best practices to concerned communities has become critical. This is the major objective of an ECP grant to the International Institute for Rural Reconstruction. The results of this project will be used in IFAD-funded projects in Bhutan, Cambodia, northeast India, Indonesia, Laos, Nepal, The Philippines and Viet Nam.
54. Given the adaptability of root crops (cassava, pigeon pea and sweet potato) to the agro-ecological conditions of the drought-prone areas of Zimbabwe, the increased production of these crops is a highly appropriate strategy for ensuring household food security. The objective of an ECP grant to AFRICARE is the promotion of root-crop production through the introduction of high-yielding varieties, the dissemination of small-scale processing techniques for use by rural women, the identification of potential markets and greater consumption of the produce. The project will be implemented within the Smallholder Dry Areas Resource Management Project, and project activities will complement those of this larger project and be replicated through the South Eastern Dry Areas Project. These projects complement government efforts to raise incomes and ensure household food security in the semi-arid regions of the country.
55. An ECP grant to the National Committee for the Protection of Fauna and Flora will be used to enhance the capacity of 30 rural communities in the region of Coquimbo, Chile, in their efforts to identify strategies to control desertification and to design projects linked to the implementation of the National Action Plan, formulated in response to the CCD. The Coquimbo region is characterized by a high incidence of poverty and severe desertification. The one-year ECP grant will help raise the awareness of the rural poor about the problem of desertification by providing communities with the basic tools to diagnosis the local environment. Local-level projects will aim at designing various strategies to control desertification, while building the capacity of

regional governmental bodies that may favour initiatives to combat desertification. Linkages will be established between the activities financed by the grant and the ongoing IFAD-financed Agricultural Development Project for Peasant Communities and Smallholders of the Fourth Region.

56. A cluster of six ECP grants has been extended to the Global Coordination Unit of the International NGO Network on Desertification and Drought and five of the network's subregional focal institutions covering Africa and Latin America for the Community Exchange and Training Programme. In accordance with IFAD's strategic objective to offer resource users direct access to information on management activities that are feasible in their environments and with their resources, this programme seeks to mobilize the already existing traditional technologies and knowledge about sustainable natural resource management in drought-prone areas. The programme will accomplish this by organizing exchange visits among local communities and training among community members and the NGOs associated with the initiative.

### **Land Degradation**

57. In harmony with its own objectives, as well as those of the Global Mechanism, namely, to improve the living conditions and food security of the poor, IFAD is promoting and financing projects focused on arresting land degradation and water depletion. Approximately 70% of IFAD's projects are located in ecologically fragile marginal environments.<sup>15</sup> Large land areas have become degraded through: (i) the encroachment of farming onto marginal lands (overcropping); (ii) fuel wood collection and overgrazing and the concomitant loss of vegetation; and (iii) changes in land tenure and misguided settlement incentives such as subsidized barley undermining traditional land-use practices. The most severe form of degradation is manifested around settlements and within a radius of 1 to 5 km around water points. Of all land-use systems, arid rangelands have undergone the greatest degradation. It is the degradation of arid rangelands along desert margins that gave birth to the very concept of desertification. Yet, at the same time, arid rangelands are demonstrably highly resilient ecosystems.

## **V. DESERTIFICATION**

58. Desertification is defined by the CCD as land degradation in arid, semi-arid and dry sub-humid areas of the world.<sup>16</sup> It can be attributed mainly to four types of human activity: (i) overcultivation; (ii) overgrazing; (iii) deforestation; and (iv) poorly drained irrigation, causing salinization and waterlogging of the soil. However, the roots of degradation are often the insecurity of land tenure and the absence of incentives for land conservation.

### **Global Mechanism**

59. The CCD, which entered into force in December 1996, is a comprehensive response by the international community to the complex interactive factors of desertification. It is an expression of their awareness that international assistance can put in place suitable corrective mechanisms, building on the depth of understanding of local people about their particular environments. Successive Conferences of Parties to the convention, held in Rome (Italy), Dakar (Senegal) and Recife (Brazil) during 1997-99, detailed a role for IFAD and for the Global Mechanism. In October 1997, in recognition of its competence and long involvement in drylands management through consultative and participatory approaches, IFAD was selected to house the Global Mechanism of the CCD. The role of the Global Mechanism in this field is to promote actions

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<sup>15</sup> IFAD draft Annual Report 1999, 20 January 2000.

<sup>16</sup> Land degradation was defined in 1994 by the Inter-governmental Negotiating Committee of the CCD as the reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland or range pasture forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as (i) soil erosion caused by wind and/or water, (ii) deterioration of the physical, chemical and biological or economic properties of soil and (iii) long-term loss of natural vegetation.

leading to the mobilization and channelling of substantial financial resources to affected developing countries, including the transfer of technology, on a grant basis or on concessional or other terms. The Global Mechanism commenced operations in 1998 and progressively established that its role is to build partnerships around the objective of securing the financial and technical means for the creation of sustainable development programmes and projects related to the CCD. In particular, the Global Mechanism facilitates the preparation of action programmes at the national, subregional and regional levels through the promotion of integrated donor and national efforts to secure resources. The Global Mechanism also forges partnerships using its own resources in a catalytic way to cofinance the development of action programmes and to 'kick-start' initiatives derived from them.

### **National Action Programmes**

60. National Action Programmes are the vehicles for the implementation of the CCD. They are being used in certain countries to provide an investment framework that will promote sustainable dryland management from the grass roots upwards, while addressing interrelated issues such as rural poverty and social inequity. These investment frameworks offer new opportunities for national and international organizations to collaborate in fostering community-based initiatives to diminish the threat of desertification and to alleviate rural poverty. To date, the Global Mechanism has helped establish National Action Programmes in Burkina Faso, Mali and Senegal, where it has provided small start-up grants. Plans are being reviewed for programmes in Algeria, Cuba, Haiti, Peru and Tunisia.

### **Subregional and Regional Action Programmes**

61. The Subregional Action Programmes and the Regional Action Programmes integrate features similar to those of the National Action Programmes among adjoining countries. They cover a wide range of activities and thematic networks, including the management of shared water and other resources, as well as transborder ecosystems such as rangelands, forests, mountain systems and oases. In this way, the Subregional and Regional Action Programmes avoid duplication, favour the achievement of more significant priorities and facilitate the coordination of public policies within subregions.

## **VI. FUTURE PRIORITIES AND DEVELOPMENT ISSUES**

### **IFAD Priorities and Regional Opportunities**

62. The improved management of natural resources in marginal areas, including drylands, have traditionally been of prime concern to IFAD and are likely to remain so. Featuring within the opportunities identified in four IFAD regions, i.e., Western and Central Africa, Eastern and Southern Africa, Asia and the Pacific, and the Near East and North Africa, are natural resource management, support for anti-desertification initiatives, and the development of marginal, upland and mountainous areas (see Appendix I). In the IFAD Programme of Work and Budget for 2000, programme focus was sharpened to include the expansion of efforts in dry zones and fragile ecosystems, such as upland areas, where intrinsic poverty and food insecurity, combined with environmental degradation, call for innovative approaches and where IFAD's knowledge accumulated to date can serve as a foundation for partnership arrangements and the pooling of resources (see Appendix II). Closer interaction between the Programme Management Department and the Global Mechanism is envisaged.
63. IFAD will continue the development of a pipeline of land degradation control projects for prospective financing by the Global Environment Fund (GEF) to assist countries' access to GEF funds. Currently, IFAD has two such projects in the pipeline: (i) Mali's Community-based Natural Resources Management and Biodiversity Conservation in the Interior Delta of Niger, Mopti region; and (ii) Belize GEF Project.

### **Specific Development Priorities<sup>17</sup>**

64. In terms of IFAD's perspective on poverty alleviation, the specific priorities to be achieved in order to foster sustainable development are as follows:

- continued support for dryland-related research and training;
- continued support for the generation of environmentally sound dryland technologies that are demand-driven, complement useful indigenous skills and practices and are replicable;
- the continued strengthening of the capacity of local communities to manage natural resources, rangeland and the environment;
- the identification of indigenous crop, soil and water conservation technologies and the adaptation of these technologies within regions, especially West Africa (as outlined in Appendix V); and
- the strengthening of international cooperation and strategic working relationships among development partners.

### **Development Issues**

65. A significant phenomenon in sub-Saharan Africa that IFAD needs to address is that of reverse migration from overpopulated high-potential areas to the dryland areas, partly due to land fragmentation and lopsided development in the more well endowed lands, such as food production and infrastructure creation with no commensurate investment in human capacity, for instance education and family planning — only to fuel uncontrollable civil strife, as in Burundi, The Congo, Rwanda and Uganda. An illustrative case of reverse migration is that from western Kenya to the north and northeast of the country. This situation calls for investment in agriculture and livestock production in the marginal areas on a sustained basis. A study by Fan and Hazell in India<sup>18</sup> suggests that investment in less favoured (rainfed) lands may well have a larger poverty-reducing impact than it would in well-endowed areas.

66. The major development issue related to the integrated planning and management of land resources is access to common property resources and security of tenure.<sup>19</sup> At national levels, coherent national systems and appropriate legal frameworks are needed to ensure property rights over common property resources, as well as adequate safeguards for these rights, and should encompass land administration, cadastres, valuations, monitoring and supervision.

67. At the community level, dialogue is needed between governments and the local communities that influence or control the use of common-property land resources in order to improve access to these resources. The dialogue should include traditional land-users, indigenous peoples and the landless and other disadvantaged or vulnerable groups living in poverty. Improved access means open access to common lands, including rangelands and forests, that favours vulnerable groups. All interested parties should be able to participate in the planning and development of common property land resources so that local decision-making can overcome any cultural or traditional barriers to access to these resources. Local-level decision-making is likely to be more in tune with local conditions than is national-level decision-making.

### **Support for Global Mechanism Processes**

68. Continued and deepened support for the CCD in general and for the Global Mechanism in particular has been expressed as an international priority. The CCD, which is the only convention specifically aimed at redressing land degradation and promoting sound management in developing countries, has not yet received adequate international financial resources. The wealth

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<sup>17</sup> This section draws on "IFAD's Contribution to the CSD-8 Process", internal office memorandum from PT, 22 February 2000.

<sup>18</sup> "Linkages among Government Spending, Growth and Poverty in Rural India". Research Report No. 110. IFPRI, Washington, D.C.

<sup>19</sup> See section II, A4, paragraphs 10-12.

of practical insights developed by IFAD proves invaluable to designing sustainable drylands development policies at local and national levels. The Ad Hoc Working Group on Integrated Planning and Management of Land Resources and on Agriculture noted, in February 2000, that implementation of the CCD, with adequate financial backing for the Global Mechanism, following the model of the GEF, could make an important contribution to land planning and management.<sup>20</sup>

### **Expanded International Cooperation in the Global mechanism**

69. New avenues of collaboration in Latin America to foster community-based management of drylands was reviewed jointly by the Inter-American Development Bank and the Global Mechanism at a workshop in late 2000.

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<sup>20</sup> The Report of the Ad Hoc Working Group on Integrated Planning and Management of Land Resources and on Agriculture. 28 February 2000, New York.

## REGIONAL OPPORTUNITIES

Region	Western and Central Africa	Eastern and Southern Africa	Asia and the Pacific	Near East, North Africa and Central Europe
<b>Opportunities for IFAD</b>	Focus on natural resource management and the environment and emphasize support for anti-desertification initiatives.	In conjunction with CCD initiatives, enhance crop production and soil fertility in rangelands and marginal areas by optimizing land and water use.	Reorient development strategies, priorities and practices to focus on marginal and upland areas.	Direct IFAD loan resources at mountainous areas where poverty is most severe.

**Source:** Extract from THE Programme of Work and Budget for 2000, Agenda Item and GC 23L, 21 December 1999.

## DRYLANDS LAND-USE CHARACTERISTICS

<i>Drylands Land Uses: Main Characteristics</i>	<i>State of Resources and Services</i>	<i>Interactions and Multi-functionality</i>
<p><b>1. Food Production</b> Mainly produced by smallholding, rainfed farming systems for local consumption and markets (often semi-subsistence). Usually located close to water resources (rivers, wells, reservoirs). Crop species and varieties produced according to climatic and soil adaptability, availability of seeds and inputs, food habits, and suitability to storage and processing. Often, women's duty to care for food gardens.</p>	<ul style="list-style-type: none"> <li>• <i>Limited topsoil</i>, with poor organic matter, variable structure (from hard clay to sandy), and often high salinity, and exposed to wind erosion and runoff.</li> <li>• <i>Poor and variable water availability</i>, unless irrigation is provided.</li> <li>• <i>Poor</i> quantity and quality in the supply of <i>services and inputs</i>.</li> <li>• Poor development of roads and other infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Competing</i> for water resources with livestock, tree planting and domestic consumption.</li> <li>• <i>Benefiting</i> from organic matter produced by livestock, shelter provided by trees (agroforestry).</li> <li>• <i>Providing</i> food for households, goods for markets, income opportunities.</li> </ul>
<p><b>2. Cash Crops</b> Their expansion is usually limited to irrigated areas and to species tolerant to high temperature, water stress and high salinity. They may include food crops for national and international markets (e.g. dates in oases, tropical fruits) or industrial crops (e.g. cotton). Intensive farming may prove difficult, with high input requirements and low yields. Smallholding units may prove profitable when food security is ensured and low-input farming systems are developed.</p>	<ul style="list-style-type: none"> <li>• <i>Arid soils are rapidly exhausted by intensive cropping and monoculture</i>.</li> <li>• The availability of <i>rainfall or irrigation</i> is a limiting factor. Surface irrigation may prove inefficient or even negative, with high evaporation rates and the potential increase of salinity.</li> <li>• <i>Pest infestations</i> are more recurrent and damaging in intensive cropping, with increasing control costs.</li> <li>• <i>Mechanization is generally poor</i> in most drylands in developing countries.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Providing</i> income-generation opportunities for farmers.</li> <li>• <i>Competing</i> with food crops and rangeland for land space and water resources (question of priorities).</li> <li>• <i>Depending</i> on storage, processing and transport capacity (commercial infrastructure).</li> <li>• <i>Requiring</i> higher capital investments and access to credit.</li> <li>• <i>Depending</i> on market prices and economic fluctuations.</li> </ul>

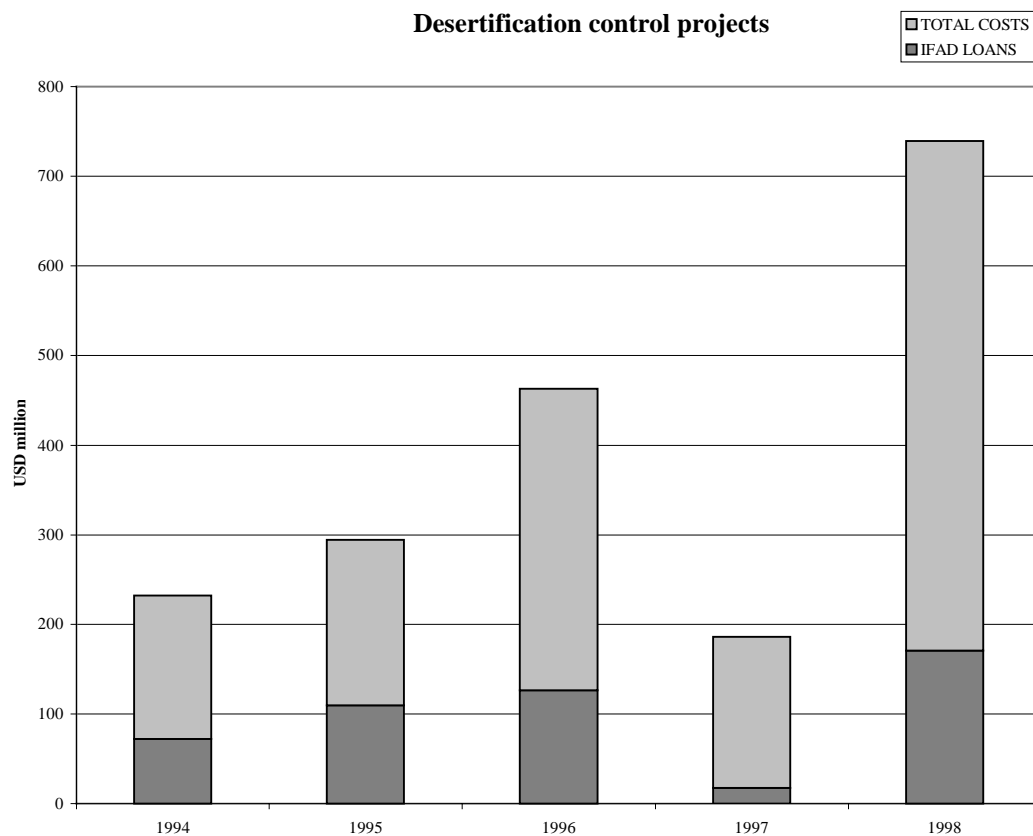
<p><b>3. Range Farming</b> Raising animals adapted to dryland conditions (sheep, goats, cattle, camels). Extensive farming, with high mobility of stocks according to seasonal rains, water resources and pasture. Stock health and productivity vary according to season and nutrition. Preferred ‘multi-functional’ animals (i.e. sheep for wool, meat and milk in semi-arid Patagonia).</p>	<ul style="list-style-type: none"> <li>• <i>Poor and variable edible vegetation coverage, with poor nutrition value in dry seasons</i> and sensitivity to overgrazing.</li> <li>• Poor and variable quantity and quality of <b>water</b>.</li> <li>• Mostly local animal species and varieties with low productivity, but good adaptation to harsh conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Competing for water and land</b> resources with agriculture and domestic consumption.</li> <li>• Providing <b>food and income</b> sources, as well as <b>wealth</b> and power to owners.</li> <li>• Providing organic matter for <b>soil and agriculture</b>, and skins and materials for domestic uses.</li> <li>• Means of <b>transport</b> (e.g. camels).</li> <li>• Influence the social structures and habitats of pastoral communities (mobility, land tenure).</li> </ul>
<p><b>4. Trees , Woodlands and Forests</b> Forest vegetation is usually poor in drylands and mainly characterized by <u>low density of species tolerant to water stress and to arid soil conditions</u>. Composition and density depend on geophysical factors, the proximity of water resources (oases, rivers, valleys), and variability and distribution of rainfall. <u>Wood harvest for fuel and building materials is still very common in African drylands and in remote areas where no alternative is available</u>. Tree population often represents an indicator of demographic pressure and land degradation. <u>Tree plantation has been increasingly used for dune stabilization</u> and production of fodder around settled areas.</p>	<p>In most drylands, forest and tree resources are common property, and access and use are regulated according to custom.</p>	<ul style="list-style-type: none"> <li>• Trees and forests help <b>stabilize soil</b> structure, organic nutrient content and water storage.</li> <li>• <b>Protect soil from wind erosion</b> (particularly in sandy soils).</li> <li>• Provide <b>shelter and recreational areas</b> (social function).</li> <li>• Provide <b>firewood, domestic materials</b> and tools (including clothes) for households.</li> <li>• Create shelter and favourable ecosystems for <b>wildlife and range farming</b>.</li> <li>• Provide wild fruits and plants for <b>food and traditional medicine</b>.</li> <li>• Enhance crop productivity (<b>agroforestry</b>).</li> </ul>

**Source:** “Multi-functional Character of Agriculture and Land”, Background Paper on Dryland, FAO-Netherlands, June 1999.

## IFAD V: PLAN OF ACTION (2000-01)

Policy Objectives	Recommendations and Actions
<ul style="list-style-type: none"> <li>• <b><u>To sharpen programme focus:</u></b></li> <li>(i) Allocate more resources to countries with greater needs and, more specifically, concentrate at least 67% of resources on countries eligible for highly concessional loans.</li> </ul>	<ul style="list-style-type: none"> <li>• Finalize the review of regional allocations (<i>September 2000</i>).</li> <li>• Obtain the support of the Executive Board for a three-year rolling regional-allocations programme (<i>annual</i>).</li> </ul>
<ul style="list-style-type: none"> <li>(ii) Direct the programme of assistance towards middle-income countries in which there are clear opportunities for innovative projects, for leveraging institutional and policy reorientation in favour of the rural poor, and for the mobilization of more domestic resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Project documents for middle-income countries should emphasize innovation and leveraging potential (<i>ongoing process</i>).</li> </ul>
<ul style="list-style-type: none"> <li>(iii) Expand efforts in <u>dry zones and fragile ecosystems</u>, such as upland areas, in which intrinsic poverty and food insecurity, combined with environmental degradation, call for innovative approaches and in which IFAD's accumulated knowledge can serve as a foundation for partnership arrangements and the channelling of other resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a larger number of projects for these areas and allocate a higher volume of resources, with longer commitment periods (through approaches such as the flexible lending mechanism) (<i>ongoing process</i>).</li> <li>• Develop a joint programme of work with the Global Mechanism of the CCD (<i>2000</i>).</li> <li>• Submit triennial progress reports.</li> </ul>
<ul style="list-style-type: none"> <li>(iv) Use grant resources to further the core objectives of IFAD, in particular, by promoting innovative policy initiatives, institutional solutions, technological improvements and knowledge sharing.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a grant policy and strategies to sharpen the focus of grant resources (<i>April 2000</i>).</li> <li>• Submit triennial progress reports.</li> </ul>

**Source:** Report of the Consultation to Review the Adequacy of the Resources Available to IFAD, CRR I/5 R IFAD, 20 December 1999.



**APPENDIX V**

**REPLICABLE INDIGENOUS SOIL AND WATER-CONSERVATION TECHNIQUES IN  
SELECTED WEST AFRICAN COUNTRIES**

Country	Region	Rainfall (mm)	Pop'n Density (person/km <sup>2</sup> )	Indigenous Soil and Water Conservation Techniques	Major Crops
<b>Burkina Faso</b>	Southwest	1 000-1 100	35	Stone bunds in slopes, network of earth bunds and drainage channels in lowlands	sorghum, millet, maize
	Southwest	1 000	35-80	Contour stone bunds on slopes, drainage channels	sorghum, millet
<b>Cameroon</b>	Central	400-700	29 (1975)	Stone lines, stone terraces, planting pits (zay)	sorghum, millet
	North	800-1 100	80-250	Bench terraces (0.5-3 m high), stone bunds	sorghum, peanuts, millet
<b>Cape Verde</b>	S. Antao Island, North Cape Verde	400-1 200 (in uplands)	100	Dry stone terraces (walls 1-2 m high), rectangular basins (approx. 2 m x 4 m)	millet, maize, cotton
<b>Chad</b>	Ouaddai	250-650	5-6 (1987)	Water harvesting drier regions: various earth-bunding systems with upslope wingwalls and catchment areas	millet, sorghum
<b>Niger</b>	Ader Doutchi Maggia	300-500	n/a	Stone lines, platine pits (tassa)	sorghum, millet
<b>Mali</b>	Djenne-Sofara, Central Mali	400	20-30	Pitting systems	sorghum millet
	Central	500-650	13-85 average 25	Cone-shaped mounds, planting holes, terraces, square basins, stone lines, bunds or low walls, millet stalk trash lines	millet, sorghum, onions
<b>Togo</b>	North	1 400	800	Bench terraces and contour buds, (rectangular) mound cultivation	yam, millet, rice

**Source:** "Soil and Water Conservation in Sub-Saharan Africa: Towards Sustainable Production by the Rural Poor". Report prepared for IFAD by Amsterdam Free University, Centre for Development Cooperation Services, January 1992.