

The Drylands Advantage

Protecting the environment, empowering people

“Recognition of the true value of ecosystem services, and of the opportunities they offer, will enable better planning and realization of the full economic potential of dryland ecosystems, rebutting the common perception that drylands are ‘economic wastelands’” (IUCN, 2009).

The Drylands Advantage

**Protecting the environment,
empowering people**

Acknowledgements

This review was prepared by the IFAD Environment and Climate Division based on project documentation and other materials listed under References.

Prepared by: Soma Chakrabarti, Independent Consultant.

Internally reviewed by the following at IFAD: Estibalitz Morras Dimas, Environment and Climate Change Portfolio Officer (Environment and Climate Division); Sunae Kim, Environment and Climate Change Portfolio Officer (Asia and the Pacific); Oliver Page, Regional Climate and Environment Specialist (Latin America and the Caribbean); Jacopo Monzini, Senior Technical Specialist, Climate Change and ENRM (Near East and North Africa); Eric Patrick, Adaptation Specialist (Environment and Climate Division); Rami Salman, Regional Climate and Environment Specialist (Near East and North Africa); Naoufel Telahigue, Regional Climate and Environment Specialist (West and Central Africa); and Steve Twomlow, Regional Climate and Environment Specialist (East and Southern Africa).

Externally reviewed by: Sasha Alexander, United Nations Convention to Combat Desertification.

Editorially reviewed by Brian Thomson, Senior Knowledge Management and Communications Specialist (Environment and Climate Division).

© 2016 by the International Fund for Agricultural Development (IFAD)

The opinions expressed in this publication are those of the authors and do not necessarily represent those of IFAD. The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of IFAD concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The designations "developed" and "developing" countries are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the development process.

All rights reserved

Cover photo: ©IFAD/Joanne Levitan

ISBN 978-92-9072-690-6

Reprinted November 2016

Table of Contents

Acronyms	4
Introduction	5
China: Boosting biodiversity for benefits to people and the environment	9
Jordan: Sustainable land management	15
Nicaragua: Nutrition security in the Dry Corridor in the face of El Niño	21
Senegal: What a little freshwater can do	27
Swaziland: Grass-roots governance beats overgrazing and gully erosion	32
Conclusions and next steps	37
References and resources consulted	39

Boxes

Box 1: IFAD and the United Nations Convention to Combat Desertification (UNCCD)	7
Box 2: PRC-GEF Partnership to Combat Land Degradation in Dryland Ecosystems	11
Box 3: Multiple benefits in Sihouzi village, Guanghe country, Gansu	14
Box 4: Reforestation and rehabilitation in Jordan	17
Box 5: Women entrepreneurs strike out in new directions	19
Box 6: Target groups in NICAVIDA (Nicaragua)	24
Box 7: New rice for new livelihoods	30
Box 8: Gaping gullies in Mamba Chiefdom	34
Box 9: Mamba Chiefdom homesteads turn sustainable land management practitioners	35
Box 10: Expanding roles for women to restore drylands	38

Acronyms

ARMP II	Agricultural Resource Management Project Phase II
CAP	community action plan (Jordan)
CDP	Chiefdom Development Plan
EMG	Environment Management Group of the United Nations
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
ha	hectare
ICARDA	International Center for Agricultural Research in the Dry Areas
IEM	integrated ecosystem management
IUCN	International Union for Conservation of Nature and Natural Resources
LUSLM/LUSIP	Lower Usuthu SLM Project/Lower Usuthu Smallholder Irrigation Project
NAP	National Action Plan
NICAVIDA	Sustainable Development for Rural Families in the Dry Corridor of Nicaragua Project (<i>Proyecto de Desarrollo Sostenible de las Familias Rurales en el Corredor Seco de Nicaragua</i>)
NNR	National Nature Reserve (China)
PAFA	Agricultural Value Chains Support Project (<i>Project d'appui aux filières agricoles</i>)
PRC	the People's Republic of China
SDG	Sustainable Development Goal
SLM	sustainable land management
UNCCD	United Nations Convention to Combat Desertification

Introduction

What are drylands and why are they important?

Present in each continent and covering over 40 per cent of the earth, drylands generally refer to arid, semi-arid and dry subhumid areas, and are home to more than 2 billion people, or one in three people in the world. Drylands are key to global food and nutrition security for the whole planet, with up to 44 per cent of the world's cultivated systems located in drylands.

Drylands also support important ecosystems ranging from rangelands and grasslands to semi-desert, and host 1.1 billion hectares of forest – more than a quarter of the world's forest area.¹ Rangelands support 50 per cent of the world's livestock and are habitats for wildlife, while livestock production and croplands dominate in more arid and dry subhumid areas, respectively. Drylands, despite their relative levels of aridity, contain a great variety of biodiversity, with many animal and plant species and habitats found only in drylands and playing a vital role in the livelihoods of many dryland inhabitants (IUCN, 2012). They are also important for climate regulation: according to the Millennium Ecosystem Assessment (UN, 2005, chapter 22), total dryland soil organic and inorganic carbon reserves make up 27 per cent and 97 per cent, respectively, of the global soil organic and soil inorganic global carbon reserves.

Drylands are under threat across the world. Despite their importance, drylands are being degraded through a complex combination of climatic (e.g. decreasing rainfall and evaporation of water) and human stresses, such as unsustainable farming techniques, mining and overgrazing. Water scarcity is increasing, and in many areas, desertification is expanding with serious human and environmental consequences. While soil can take up to thousands of years to build up, desertification of drylands, where soils are already fragile, is happening at an alarming rate; today, the pace of arable land degradation is estimated at 30 to 35 times the historical rate (UN, 2016 web). According to the United Nations Convention to Combat Desertification (UNCCD), desertification and degradation could be costing developing countries up to 8 per cent of their gross domestic product a year (EMG, 2012). The UNCCD also stresses that the costs are not in economic terms alone, but encompass social and well-being dimensions (UN, 2013 web); for example, desertification of drylands also leads to migration, with some 50 million people estimated as being displaced within the next 10 years (UNCCD, 2016 web).

Investing in drylands pays off

Investing in drylands, therefore, pays significant human and environmental dividends. Environment-friendly and water-efficient agriculture for smallholders is key to reducing poverty, boosting smallholder adaptation to climate change, as well

¹ "FAO study provides the most detailed snapshot to date on trees, forests and land use in the world's drylands." FAO news article, 19 July 2016.

as rehabilitating degraded lands. Improving smallholder productivity in drylands can be particularly challenging compared to other areas, but the aggregate benefits are considerable given the high combined populations (EMG, 2012), as well as the total land area they represent.

Global calls to action

Despite the importance of drylands and the urgency of the need to protect them, they have not always attracted the investment they deserve – this may be due to misconceptions of drylands being ‘wastelands’ without potential (IUCN, 2009). Things began to change when, during the 1992 Rio Earth Summit, desertification, climate change and the loss of biodiversity were identified as the planet’s greatest challenges to sustainable development. The United Nations Convention to Combat Desertification was established in 1994, and the Convention addresses specifically the arid, semi-arid and dry sub-humid areas, where some of the most important but vulnerable ecosystems and people can be found. Today, the Sustainable Development Goals (SDGs) also reaffirm the importance of drylands, “*recognis(ing) that social and economic development depends on the sustainable management of our planet’s natural resources*”;² and pledging to conserve and sustainably use drylands, as expressed in Goal 15.1: “*By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements*”.³

IFAD’s role in supporting dryland ecosystems and smallholder livelihoods

In 2012, the Environment Management Group (EMG) of the United Nations called for more attention to drylands, and today, many more development partners are putting the drylands at the heart of the work. The International Fund for Agricultural Development (IFAD) has long championed investing in drylands to improve both productivity and social outcomes while managing the development footprint on the environment. For example, in Africa, where drylands are particularly fragile, IFAD has invested approximately US\$3 billion since 2000 in initiatives related to the objectives of the UNCCD. IFAD is also proud to have contributed to the initial phases of global action (see Box 1).

Currently, many investments of IFAD’s Adaptation for Smallholder Agriculture Programme, as well as many of its regular loans and grants, are focused on the world’s drylands. Recently, IFAD has also taken up the challenge of estimating mitigation co-benefits of its adaptation investments, many of which are in drylands;⁴ this will enable IFAD to understand how it is supporting countries to meet national targets to cut emissions in line with the Paris Agreement at the 21st Conference of the Parties (COP21).

2 Article 33. United Nations SDGs, 2015.

3 Goal 15 is to “Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”.

4 The Mitigation Advantage: Maximizing the Co-benefits of Investing in Smallholder Adaptation Initiatives. IFAD, 2015b.

Box 1: IFAD and the United Nations Convention to Combat Desertification (UNCCD)

IFAD has assisted a number of countries in preparing their National Action Plans (NAPs) under this mechanism. In June 1996, IFAD convened the International Forum on Local Area Development to support the implementation of NAPs. IFAD also hosted the Global Mechanism (GM) of the UNCCD from 1999 to 2014. The GM offers strategic advisory services to developing countries on how to increase investments in sustainable land management (SLM) and promotes “integrated financing strategies (IFS)” to achieve investment frameworks for SLM.

Source: UNCCD website, and “Desertification as a Global Problem”. IFAD, 2001.

IFAD’s approach in drylands

Having funded projects in drylands for over three decades, IFAD has developed a flexible portfolio of approaches and technologies to support human and environmental benefits. Wherever possible, IFAD supports countries to achieve Rio Convention⁵ synergies in drylands. For example, the China case study illustrates an “integrated ecosystems management” approach, an ecological and landscape-based approach that also takes social and economic dimensions into account and delivers biodiversity benefits. Similarly, all the case studies take climate change adaptation needs into account.

With regard to people, IFAD has always believed in smallholder-driven rural development, and this holds true of its experience in drylands. Techniques such as “farmer-managed natural regeneration”, participatory mapping of natural resources leading to “talking maps” (IFAD, 2009), and community-based natural resource management are examples of how IFAD has been working with smallholders to restore degraded lands and agricultural productivity. IFAD seeks to build on smallholders’ and indigenous knowledge and blend this with new technologies, such as in developing drought-tolerant plants. In terms of climate change, which threatens to further aggravate land degradation, IFAD’s approach has involved improving the coping capacities of poor rural communities through agroforestry, soil and water management, crop management, livestock production systems and livelihood diversification, among other techniques. In addition, practical water-related approaches with multiple benefits applied by IFAD include rainwater harvesting, floodplain restoration, modern and efficient irrigation systems, improved water storage, and reuse of wastewater.

Multiple benefits for drylands and their peoples

Over the years, IFAD and its partners have seen some important achievements. For example, IFAD has contributed to the re-greening of the Sahel region of Africa;

⁵ The three “Rio Conventions” are: Convention on Biological Diversity, the UNCCD and the United Nations Framework Convention on Climate Change.

in the Central Plateau of Burkina Faso alone, up to 300,000 hectares (ha) were rehabilitated.⁶ In Niger, deforestation had led to the loss of fertile soil and, present for 30 years, IFAD's project in the Department of Aguié regenerated 100,000 ha by protecting land from overgrazing and deforestation and replanting trees. Where before it was barren, now there are about 50 new trees per hectare. Similarly, in the Syrian Steppe, 10 million ha of land are severely degraded; IFAD has managed to restore vegetation to approximately one third of the rangelands through close cooperation with local herders and farmers. Through combinations of resting land, limiting grazing, reseeding, planting shrubs, promoting indigenous species, improved irrigation and soil banks, IFAD has halted desertification and reclaimed over a million hectares of land. In the *Caatinga* Forest of Brazil, extended yearly droughts have devastated the landscape for years.⁷ IFAD's work with local communities here has turned what was once a monochrome harsh landscape into an oasis with water tanks and irrigation schemes keeping the land fruitful and ensuring that the families relying on the land are fed.

The case studies from China, Jordan, Nicaragua, Senegal and Swaziland in the following pages present some further examples in more detail.

⁶ Re-greening the Sahel: Developing Agriculture in the Context of Climate Change in Burkina Faso. IFAD, 2011b.

⁷ See case study from Brazil: Adaptation to Climate Variability in North-eastern Brazil's Sertão Region: Transforming the Semi-arid Zone and Facilitating Coexistence with Dry Conditions. IFAD, 2011a.



©IFAD/Qilai Shen

China: Boosting biodiversity for benefits to people and the environment

Project area



Quick facts⁸

Project name	An Integrated Ecosystem Management (IEM) Approach to the Conservation of Biodiversity in Dryland Ecosystems
Dates	2011-2016
Target groups	Poor rural households in three eco-zones in three provinces in China's western region, with women and extremely poor rural households in remote areas receiving the highest priority. Approximately 456,000 rural population in 450 villages.
Financing	IFAD, Global Environment Facility (GEF), Government of the People's Republic of China (PRC), smallholders

Development challenge

Dryland areas in the west of China cover about 40 per cent of the country's total land area and are very vulnerable to drought and desertification. About 27 per cent of the country is now affected by some of the most severe land degradation in the world, creating livelihood risks and vulnerability for several hundred million people and around 20 per cent of the world's population. Alarming, the area of degraded lands is expanding at a rate of about 3,500 km² a year due to a combination of unsustainable agricultural practices, deforestation and mismanagement of water resources.^{9, 10}

Project response

The project was developed as part of a broader framework of the PRC-GEF Partnership to Combat Land Degradation in Dryland Ecosystems (see Box 2), spearheaded by the Global Environment Facility (GEF), the Government of China and the Asian Development Bank.

This project aimed to achieve significant reductions in loss of biodiversity in selected dryland ecosystems affected by land degradation. The project's global environmental objective was to demonstrate synergies associated with site-specific integrated ecosystem management (IEM) strategies, leading to: (i) increases in biodiversity conserved; (ii) partial restoration of ecosystem integrity and recovery of underlying functions and services; and (iii) promotion and use of appropriate renewable energy technologies designed to reduce pressure of forest resources and project sites. Socio-economic objectives were to achieve a sustainable increase in productive capacity, both on and off farm, and to offer increased access to economic and social resources while improving the biophysical environment in the project area.

⁸ This case study is based on supervision and implementation reports by IFAD.

⁹ Source: <https://www.thegef.org>

¹⁰ Asian Development Bank. 2010.

Box 2: PRC-GEF Partnership to Combat Land Degradation in Dryland Ecosystems

The partnership brings together national and international organizations to support integrated ecosystem management (IEM) approaches in combating land degradation, reducing poverty and restoring dryland ecosystems in China's western region. The programme is implemented by the central government and spans Inner Mongolia, Shanxi, Qinghai, Gansu, Ningxia and Xinjiang provinces. It supports a sequenced set of priority activities to strengthen the enabling environment and build institutional capacity for IEM approaches to combating land degradation. It also demonstrates viable IEM models for widespread dissemination and replication.

The goal of the partnership is to strengthen the enabling environment and promote an integrated approach to reduce land degradation, alleviate poverty and conserve biodiversity, while also restoring, sustaining and enhancing the protective and productive functions and services of dryland ecosystem resources in western China.

Source: GEF website – PRC-GEF Partnership to Combat Land Degradation in Dryland Ecosystems.

The project aimed at achieving the objectives through four main components:

1. Policy and institutional strengthening
2. Community-based ecological planning and restoration and alternative/sustainable livelihoods
3. Protected areas and biodiversity conservation
4. Public awareness

Planning, policy and institutional strengthening

The main outputs revolved around establishing a solid evidence base for policy engagement, sensitization to emerging key issues, as well as laying the foundation for institutional arrangements to support a new way of doing things. Site-specific IEM plans and various studies, including on payment of ecosystem services, were carried out to guide decision-making and policy formulation processes at the provincial, county and local levels. These had two perspectives: a short-term one of five years was key to informing project-supported interventions, and a longer-term one of 15 years took a broader view. Institutional arrangements were assessed with a view to support the implementation of the planned IEM plans, and training for staff and farmers on relevant issues was organized to engage them as active partners from the start.

Community-based ecological planning and restoration and alternative sustainable livelihoods

This component focused on two priorities: establishing community-based environmental planning and restoration and promoting alternative sustainable livelihoods. Community-based environmental planning and restoration supported

the “mainstreaming” of IEM concepts into Village Development Environmental Plans in participating villages. The second priority was about helping farmers as well as the environment through win-win strategies. Alternative livelihood activities supported by the project included increasing the diversity of native tree species used in village reforestation activities and rehabilitating lands affected by gully erosion, piloting and harvesting of traditional Chinese medicinal herbs and domesticating wild mushrooms, and integrating biogas systems into agricultural production on farms. These village-level interventions were designed to boost environmental services at the local level.

Protected areas and biodiversity conservation

Activities under this component included learning visits to other Chinese protected areas that reflect good practice in their management, demarcating clearly the boundaries of protected areas and the promotion of co-management approaches. Grasslands were targeted for restoration, and biodiversity monitoring programmes were established.

Public awareness

As its name implies, this component was designed to reach out to the broader public and the future generation through engaging with stakeholder groups in public workshops, and giving visibility to the environment and biodiversity in events such as local competitions and festivals.

Environmental impacts

- The three project provinces have all completed the development of site-specific IEM plans, with technical support from the project, national agencies, education and research institutions, and local decision makers; they have all been endorsed by relevant government agencies at the provincial level. In addition, Mount Taizi’s National Nature Reserve (NNR) plan has been accepted by the State Forestry Administration, which means that the government will increase support to this NNR in the future. This, together with the upgrading of Mount Taizi Reserve from a provincial to national reserve, is a significant achievement.
- Studies on payment for ecosystem services have also been completed in the provinces.
- 288 Village Development Environment Plans have been completed and some have started implementation.
- About 15 hectares of degraded natural grasslands have been restored, more than 200 per cent above target.
- To restore the degraded land in the NNR, approximately 8,500 trees have been planted, and some farmland in the experimental zones have been converted to natural vegetation with government support. Mount Luya NNR established check dams at critical areas with significant soil erosion, and today the eroded area is observably shrinking.

- In Haba Lake NNR of Ningxia, the vegetation cover increased from 33.4 per cent to 36.9 per cent from 2012 to 2014, the average height of vegetation increasing from 16.7 cm to 18 cm, and the amount of biomass also increased. In Mount Taizi NNR, the forest coverage has increased from 31.17 per cent to 35.07 per cent since 2012.

Socio-economic impacts

- The income of local farmers has increased about 20 per cent compared with before project implementation in 2012. For example, in Yanchi county of Ningxia, the farmer's annual mean income in 2012 was 4,793 Chinese Yuan Renminbi (about US\$720), and went up to 6,975 Chinese Yuan Renminbi (over US\$1,000) in 2014. This is the result of a comprehensive programme to generate alternative and sustainable livelihoods (e.g. greenhouse vegetable production, mushroom production, warm shed livestock production). For example, 45 greenhouses in Hezheng county of Gansu were used for peppers, tomatoes and other varieties of vegetables with good economic returns and benefiting women the most. An important co-benefit of this success has been to reduce smallholders' dependence on the NNRs for natural products.
- The introduction of measures to improve access to water through pumps, canals and drip irrigation facilities have not only helped smallholders to improve their incomes from produce, but have also contributed to tackling land degradation by increasing water and soil conservation in and around the protected areas.
- The capacities of those taking part in project activities have also been strengthened. For example, the institutional capacities of the three NNRs have been strengthened (e.g. in wildfire surveillance and control, habitat restoration and erosion control). Their management effectiveness has also improved; for example, Mount Taizi NNR measured its management effectiveness annually and its score has increased from 36 in 2013 to 67 in 2015, using the Management Effectiveness Tracking tool of the World Wildlife Foundation and World Bank. Over 10,000 farmers have also taken part in environment protection awareness-building activities, thus promoting more sustainable uptake.
- Public awareness of the importance of an integrated ecosystem approach has increased through extensive campaigns throughout the project area. For example, schoolchildren and their parents were also targeted with key messages about environmental protection and land degradation control through summer camps, drawing and writing contests. Guanghe county of Gansu, for example, reported that over 16,000 schoolchildren have participated in these activities.
- Livelihoods have been diversified; for example, in 2015 in Shanxi, 26 households (16 per cent) adopted biogas technologies, and 48 households (30 per cent) shifted from growing grain to forest products.

Box 3: Multiple benefits in Sihouzi village, Guanghe county, Gansu

Before the project started, nomadic sheep herders roamed the fragile Loess Plateau ecosystems, causing severe erosion, resulting in increasingly unsustainable productivity and poverty. In 2013, the Sihouzi Sheep Rearing Farmer's Cooperative was established, and 205 households invested as shareholders in expectations of joint technical and economic benefits. The project provided scientific inputs on a range of production issues. From 2013 to 2015, the Cooperative had bred 8,250 sheep and produced 2,350 lambs, as well as provided employment to over 50 villagers. Additionally, the shareholders also enjoyed dividends of about CNY 10,000 from cooperative profits.

Environmental benefits include rapid uptake by farmers of organic fertilizer from manure, significantly reducing the need for chemical fertilizers, improved quality and safety of products, and improved fertility/organic content in soils. Additionally, biodiversity loss has been reversed in these fragile ecosystems.

Source: Project documentation.

Box 3 shows multiple socio-economic and environmental benefits in one location.



©IFAD/Jon Spaul

Jordan: Sustainable land management

Project area



Quick facts¹¹

Project name	Agricultural Resource Management Project Phase II (ARMP II), including GEF-supported “Mainstreaming Sustainable Land Management Practices” project
Dates	2010-2015
Target groups	22,300 poor rural households (134,000 inhabitants), poor rural women and men, specifically: (i) small- and medium-scale farmers; (ii) landless households depending mainly on natural resources for their livelihoods; and (iii) other disadvantaged groups
Financing	IFAD, GEF, Organization of the Petroleum Exporting Countries, Ministry of Agriculture, smallholders

Development challenge

The scarcity of water resources, even for supplementary irrigation, small and fragmented landholdings that cannot support an average family, and dwindling productivity: these are some of the challenges facing farmers relying on rainfed agriculture in Jordan’s Southern Highlands region. Forced to buy water for irrigation, smallholders resorted to reducing their plantation size or even abandoning agriculture. Added to these challenges, smallholders have limited access to technical and financial support for both agricultural and non-agricultural activities. It is easy to see why smallholders lacked the motivation to invest in meagre improvements in productivity, as they found themselves trapped in a cycle of escalating poverty as land degradation was compounded by climate change.

Project response

The Agricultural Resource Management Project Phase II (ARMP II) built on the first phase, which had begun in 1996, and focused on improving food and water security, as well as the incomes of poor rural smallholders through sustainable land management (SLM) with an emphasis on environmental conservation to start tackling the above challenges. The second phase particularly emphasized building local and national capacities and further boosting income-generating activities, especially for women.

In 2010, and under the umbrella of ARMP II, IFAD and the GEF also renewed their partnership with the “Mainstreaming Sustainable Land Management Practices” project (SLM II), contributing to the GEF Strategic Objective on Land Degradation and demonstrating successful SLM practices to fight desertification and deforestation. The

¹¹ This case study is based on the final project evaluation (IFAD, 2016).

SLMII project goal was to embed an IEM approach into national planning, thereby minimizing the causes and negative impacts of land degradation on the integrity of the Southern Highland ecosystems. The strategy to improve the quality of life of rural communities affected by land degradation can be summarized as: (i) gender-sensitive empowerment of communities; (ii) supporting SLM best practices at the local level; and (iii) embedding them into local and national frameworks.

Environmental impacts

The project evaluation in 2016 reported the following:

- At least 15,000 hectares of degraded highland agroecosystems restored, and reduced erosion in the country's Southern Highland mountains, hills and plateaus due to SLM and related investments. Also important were capacity development, more sustainable production systems and water management, together with diversified livelihoods to reduce pressure on the land.
- Climate change adaptation and mitigation through "climate-proofing" production systems, storage of greenhouse gases in agroecosystems by means of sustainable agricultural practices, improved rangeland and pasture management practices, and the restoration and protection of degraded vegetation in areas currently used for livestock.
- Improved habitats and increased diversity of biological resources, as a result of adopting sustainable grazing and agricultural practices and promoting ecosystem preservation, including reforestation and rehabilitation (see Box 4).

A long-term plan

The project also enabled policymakers and practitioners at the national and subnational levels to build awareness and assume ownership of initiatives such as those above. The goal was to promote uptake of SLM in government planning and budgets, and this was supported by capacity development and technical assistance to build a geographic information system (GIS). At the subnational level, a public

Box 4: Reforestation and rehabilitation in Jordan

Reforestation was achieved in five project sites in Jordan: Yobeel, Wadi Al-Karak, Wadi Al-Iraq, Jhaier forest and Abel forest. A total of 5,000 *dunum* were rehabilitated. The existing forests have been suffering from severe environmental stress due to low water availability for tree growth and severe soil erosion of the soil on the hillside. Yobeel forest was rehabilitated through a combination of water wells, cultivating about 6,000 new seedlings, installing an irrigation network on sloping lands with limited irrigation, trimming and pruning 1,500 trees, as well as building stone walls to prevent soil erosion.

The rehabilitation of the Wadi Al-Iraq, Wadi Al-Karak, Jhaier forest and Abel forest was achieved through similar measures as well as tree planting. As these areas are within a national park, forest rehabilitation not only helped to halt desertification and land degradation, but was also a foundation for ecotourism.

awareness and community mobilization strategy aimed to maximize the participation of stakeholders in the “Project Demonstration Agro-Ecosystems”, where SLM techniques were vetted and piloted by community members. IFAD also supported communities, drawing on the expertise of the International Union for Conservation of Nature and Natural Resources (IUCN) for community mobilization to develop Agroecosystem Action Plans in these demonstration agroecosystems, building on around 13 community action plans. These plans included a scaling-up strategy to facilitate replication from the local up to the subnational level. Planning well ahead for the future, SLM was also embedded into the formal education curricula of schools and universities and the informal education system.

Socio-economic impacts

Reliable water supply and increased productivity

The project introduced a range of technologies to address water scarcity, such as spring rehabilitation and protection, introducing on-farm storage and drip irrigation systems. Ten Water Users Associations (WUAs) were established to manage the precious resource and potential conflict over it. In Wadi¹² Al-Karak, for example, water loss was reduced through restoring existing canals and creating water reservoirs at source for farmers in five nearby villages; about 30 per cent more water now reaches them and the water flow has improved by about 20-25 m³ an hour. Farmers were able to expand agricultural production, as well as improve the quality of their produce.

Similarly, Dana, a vital natural resource in the region, is also important for agriculture at the upper part of the reserve area. However, inappropriate diversions and scheduling resulted in low water flow to farmers. The Dana WUA was established and contributed ideas for possible solutions; it was finally decided to rebuild the spring source at the upper end of Dana through concrete pools and canals, install diversion pipes for three regions, and rehabilitate olive trees and orchards in the area. As a result, 150 families are benefiting from water flow almost three times that previously. The olive trees now have higher yield, and the water is being used to grow other orchards (fig, grape, apricot, pomegranate) as well as in greenhouses for medicinal and aromatic plants. The Dana women’s association uses these plants for income-generating activities.

Community empowerment

A community empowerment approach aimed to increase the role of local farmers in managing their own development and to promote ownership (e.g. responsibility for maintaining infrastructure). Right from the start, communities were responsible for establishing appropriate criteria for identifying poor and disadvantaged households within their community. Participatory rural appraisal was also undertaken by research teams from the community.

Community action plans (CAPs) were developed to enable people to identify problems; a holistic approach allowed health, education and social problems

12 A *wadi* is a river with a fluctuating quantity of water and unpredictable flows.

(e.g. including those related to within the household), as well as water-related, agricultural and environmental problems to be identified for 13 villages. Communities also identified their own possible solutions. For example, they suggested terraces and retaining walls to address soil erosion and landslides on steep lands, and rainwater harvesting, rehabilitation of available water resources and distribution through concrete channels and closed pipes with irrigation scheduling as possible measures to address water scarcity. CAPs were the sole mechanism for allocating resources to farm and community investments – an important accountability mechanism.

To ensure that CAPs genuinely represented the views of all targeted community members, elected “local community committees” were encouraged, representing cooperatives, civil society, women and youth interests, and interested informal groups. They played an important role in community mobilization, negotiating CAPs and annual work plans with project staff, as well as monitoring actual implementation of the project interventions. These informal committees enabled project management to effectively reach the poor and disadvantaged.

Focus on women

The negative impacts of water scarcity for women as well as men were taken into account at the outset, and indeed women have made up the majority of the other targeted categories consisting of the landless (70 per cent) and other disadvantaged groups (60 per cent) – though they were in the minority among smallholders since few women own agricultural land.

Special efforts to engage women in CAPs were backed up by attention to their participation in training opportunities. The project identified a gender imbalance in training early on and took steps to encourage women to attend so that by 2015 they made up 43 per cent of participants. Indeed, women outnumbered men for topics such as “medicinal and aromatic plants”, “establishing grey water units” and “installation of irrigation networks”, which are associated with acceptable women’s roles. Gender stereotypes were challenged when 10 women out of 23 participants attended courses for agricultural engineers at Karak, Tafilah and Maan Directorates. The course content was also gender-sensitive; topics included “involving rural women in agriculture” and “creating a spirit of cooperation within the family”.

Box 5: Women entrepreneurs strike out in new directions

Mushroom production in Smakkiya village. Hala Amarieen is a 29-year-old woman who first learned about the mushroom-growing business at a project training opportunity. As she had a basement with the right humidity levels and the project could provide the initial supplies needed for a start-up, she decided to try it along with seven other women. She made a profit of around 175 Jordanian dinar (about US\$250) after two months and decided to expand her business. As one of the first mushroom growers in her village, Hala is also consulted by others on the business.

The project also worked to engage more women as course advisers so as to attract more women participants, succeeding in increasing from 3 out of 16 in the first year to 10 out of 33 the next.

Women were also interested in diversifying their livelihoods and income-generating activities, and the project responded with training on new ideas and creating six women's savings and credit groups. Credit was extended to them through a women's development component, and around 450 projects across four governorates included on-farm activities such as breeding sheep, poultry farming and food processing. Off-farm income-generating activities were also supported, including catering services, handicraft products and ecotourism. Box 5 gives an example of how a young woman benefited.

The various project activities also brought women more than training and economic returns; they reported being more able to articulate their needs and increased self-esteem.



©IFAD/David Alan Harvey

Nicaragua: Nutrition security in the Dry Corridor in the face of El Niño

Project area



Quick facts

Project name	Sustainable Development for Rural Families in the Dry Corridor of Nicaragua Project (Spanish acronym NICAVIDA, from <i>Proyecto de Desarrollo Sostenible de las Familias Rurales en el Corredor Seco de Nicaragua</i>) ¹³
Dates	2017-2022
Target groups	Approximately 30,000 families/52,100 poor and food and nutrition insecure rural people in the country's Dry Corridor, including indigenous peoples, women and youth
Financing	IFAD, Government of Nicaragua

Development challenge

Nicaragua is a country of great lakes, rivers and biodiversity, yet its location in Central America's "Dry Corridor", a semi-arid region, makes it highly vulnerable to extreme weather events. Agriculture generates 31 per cent of employment and 32 per cent of total exports of primary products. Furthermore, it is the main source of income for 80 per cent of the rural population. In recent years, production has been affected by the effects of El Niño and climate variability, and change within an already fragile context of environmental degradation and depleted water resources exacerbated by the phenomenon of change and climate variability. There have been recurrent droughts, which affect almost 45 per cent of the population; in 2014 and 2015, two consecutive droughts wrought devastating losses for smallholders. According to FAO initial estimates last year, half the total planted areas were damaged, with total crop losses in the country's most severely affected regions.¹⁴ This has severely impacted family farmers, who form the overwhelming majority of the producers, and of whom around 40 per cent are subsistence farmers and depend on their crops to live.

Project response

Project aims and strategy

The project goal is to "contribute to government objectives to improve the living conditions of rural families and indigenous peoples of the Dry Corridor", and specifically to help target groups increase their income, use natural resources sustainably, improve their food and nutrition security, and reduce their vulnerability to climate change. Improving living conditions entails not only improving sustainability of agricultural production for subsistence or markets, but also increasing diversified off-farm activities. This is because natural resources are degraded and climate risk compounds the difficulty of producing adequate and nutritious food. It is also an

¹³ The project design is still to be approved and may be subject to adjustments in the light of emerging evidence and consultations.

¹⁴ Source: FAO website – www.fao.org/emergencies/fao-in-action/stories/stories-detail/en/c/330253

important strategy to take pressure off the land. A focus on nutrition will also be evident, given IFAD's renewed commitment to this issue.¹⁵

Targeting approach

The project's geographical focus is on the Dry Corridor, which is especially vulnerable to drought and runs from north to south, connecting more than 60 per cent of the population. Not only is the area distinct from the rest of the country, but it also embraces a high degree of agro-climatic and socio-economic diversity. Climate variability and drought are experienced differently even within the Dry Corridor, so that an appropriately nuanced targeting approach is needed. NICAVIDA initially will focus on 37 more vulnerable municipalities and adapt as it learns.

Within the geographical target area, IFAD will primarily target the most vulnerable smallholders, specifically indigenous peoples, women and youth. "Transition" and "commercial farmers" (see below) will also be supported to further diversity and improve their place in value chains. Box 6 sets out the main categories of target groups following various studies and consultations.

Component 1: Developing capacities

This component aims to build the capacities of families, their organizations and the institutions that impact them, and offer training opportunities in income-generating activities and market opportunities, natural resource management within the context of climate risk, as well as nutrition education, building on traditional knowledge.

Environment and climate change

Consultations indicate the following potential topics of interest, among others:

- Agroforestry to restore agroecosystems degraded due to lack of organic matter from agricultural intensification and poor ecosystem management
- Technical aspects of building resilient livelihoods in rural families in the Dry Corridor, such as tackling deteriorating genetic diversity of major food crops, chronic droughts and changes in rain cycles
- Climate services for making farming decisions
- Innovations that blend local approaches with climate models and predictions
- Participatory analysis to build CAPs

Nutrition

Related training and sensitization will also have a focus on preparing proposals about food systems, increasing the consumption of nutrient-rich foods such as fruits, vegetables, legumes and animal products. The emphasis on nutrition is relevant because of the multiple forms of malnutrition in the Dry Corridor. IFAD has experienced that improving income does not lead per se to a better diet and nutrition in a family. Preliminary studies indicate the following risk factors in the Dry Corridor: (i) food insecurity is compounded by temporary crisis, mainly caused by

¹⁵ See "Improving nutrition through agriculture" (IFAD, 2013). IFAD has also developed an Action Plan for nutrition-sensitive agriculture, which acknowledges the links between nutrition, land degradation and climate change.

Box 6: Target groups in NICAVIDA (Nicaragua)

Landless rural families

- Very vulnerable to food and nutrition insecurity
- Rely heavily on cash from labour, migration or micro-businesses and crafts
- Often families with young and/or women heads of household

Subsistence family farmers

- Barely diversified agricultural production, limited to basic grains for consumption
- Cash income mainly from wage labour; women and youth migrate to cities or other countries, or find low-paid jobs
- During adverse weather conditions, need to lease land for subsistence grain production
- High food and nutrition insecurity and/or energy and protein insufficiency, well below Nicaraguan diet requirements
- Difficulty in accessing food for several months a year, when they resort to buying food, meaning lower quality and less food intake

Family farmers in transition

- Some agricultural production and livelihoods diversification
- Benefited from incentives from state projects and programmes and projects
- Access to better land and access to water resources; in families with better access to natural resources, agricultural production for the market represents up to 70 per cent of their income, whereas in families with less access to good quality resources, their income is mainly from non-agricultural activities (over 70 per cent) (e.g. labour and small businesses)
- Many belong to some form of producer organization
- Highly vulnerable to price fluctuations and environmental conditions, which implies high poverty levels and less access to education
- Nutritional deficiencies in protein and vitamins, despite producing/buying food

climatic threats to agricultural production; (ii) food production lacks diversity, and does not allow for reserves during a crisis; and (iii) people have unpredictable access to animal protein. The project plans to support a more detailed initial baseline study with the Ministry of Health to identify specific nutrient deficiencies in children and adults, especially rural women.

Component 2: Investment funds to turn ideas into practice

People benefiting from training and technical assistance will also be supported to develop regional and family action plans to operationalize ideas and plans. A higher score will be given to any proposals that benefit more women, indigenous peoples, and that have higher cofinancing from producer organizations or individual producers.

At the regional level, investments could include public goods and services to improve the living conditions of rural families, including investments designed to encourage a change in behaviour regarding nutrition challenges. A methodology

Commercial family farmers

- Capacities to exploit advantages of better access to land, water and markets
- Generate some surpluses that allow investments in equipment repair and renewal, technology upgrading and access to differentiated markets
- Often, 70 per cent of revenue comes from agricultural activity; these families mainly work the areas of vegetables, rice and honey
- Adequate food and nutrition status: perhaps slightly above required energy and protein levels

Adult rural women and youth

- Particularly involved in food processing, natural medicines and small businesses
- Key role in especially subsistence families, in terms of income generation and production, in addition to domestic tasks
- Many *de facto* households headed by women due to male temporary migration
- Heavy workloads and limited social capital

Indigenous peoples

- Some similarities with subsistence farmers but also unique characteristics, which will be taken into account during implementation
- Social principles such as reciprocity or "*mano vuelta*" are of great significance for indigenous families' corporate assets
- Land is communal and managed by the authorities of indigenous peoples
- Tourism and crafts are important sources of income for some indigenous peoples' communities

validated by the Ministry of the Environment and Natural Resources (MARENA) could be used to identify environmental needs, including small infrastructure, and these could be financed by the project.

Families and competitive businesses could invest in diversifying income sources, improved nutrition and better natural resource management/adaptation to climate change. Plans will be based on the active participation of all family members and grounded in a rapid assessment of their vision and needs. Home gardens, conservation agriculture, community seed banks, safe food and water, food preparation to retain nutritional values, agricultural biodiversity and dietary diversity: these are the kind of initiatives that are expected to be financed. The financing of family plans will build on a methodology that is already applied successfully in Nicaragua. The project will also support families and their organizations in preparing business plans and gaining access to credit.

Expected environmental impacts

Indicators currently envisaged include the following:

- Number of hectares with soil and water conservation measures
- Value in United States dollars of investments in agricultural infrastructure and land for cultivation protected against extreme weather events

Expected socio-economic impacts

These include:

- Child malnutrition in target areas is reduced, disaggregated by indigenous peoples and gender
- At least 80 per cent of 14,000 families increase their income
- At least 75 per cent of 6,000 families improve their food and nutrition security
- An increase in the assets of participating families



©IFAD/Roberto Faidutti

Senegal: What a little freshwater can do

Project area



Quick facts

Project name	Climate Change Adaptation Project in the Areas of Watershed Management and Water Retention, part of the Agricultural Value Chains Support Project (PAFA) ¹⁶
Dates	2012-2016
Target groups	10,000 households in the regions of Kaolack, Kaffrine, Fatick and Diourbel
Financing	IFAD, GEF and smallholders

Development challenge

Senegal is on the westernmost part of the bulge of Africa and includes desert in the north. About 75 per cent of Senegal's population is rural. Senegal faces a persistent lack of rain due to its location in the Sahel-Saharan climatic zone. In recent decades, human activities such as monoculture farming, bush fires, inappropriate or lack of fertilization and overgrazing have degraded the natural environment. This has resulted in lower production from crop and pasture lands, and an ongoing process of desertification. Declining soil productivity has prompted people to respond by clearing forests. Indeed, Senegal's forests are disappearing at an alarming rate, in the range of 40,000 hectares per year, as indicated by the FAO Global Forest Resources Assessment of 2010. Therefore, conservation of natural resources and ecosystems is a major priority and challenge.

The effects of desertification and drought have also resulted in migratory flows and massive concentrations of people along Senegal's coastal areas, as they abandon most of the land lying in the interior. Senegalese coastal areas are also vulnerable to sea level rise, which causes widespread erosion and coastal flooding in low-lying coastal areas, in particular, mangrove estuaries. Salinization increasingly affects soils, surface waters and groundwater.

All this has led to falling agricultural productivity. For example, the "groundnut basin" of Senegal, falling within the area covered by IFAD's "Agricultural Value Chains Support Project", suffers from land degradation – salinization, loss of biodiversity, loss of organic matter, erosion, etc. Water availability and rainfall is decreasing, evidenced by barely filled water ponds and isohyets¹⁷ slipping southwards (see Figure 1). Rising temperatures linked to climate change means that water for farming and life is ever more precious. This degradation has drastically reduced the incomes of rural people, which, combined with the lack of alternative sources of income and basic infrastructure, is set to worsen rural poverty as climate change makes matters worse.

¹⁶ French acronym for *Project d'appui aux filières agricoles*.

¹⁷ An isohyet is a line on a map connecting locations that receive the same amount of rainfall. The downward shift effectively means less rain for cultivated lands.

Project response

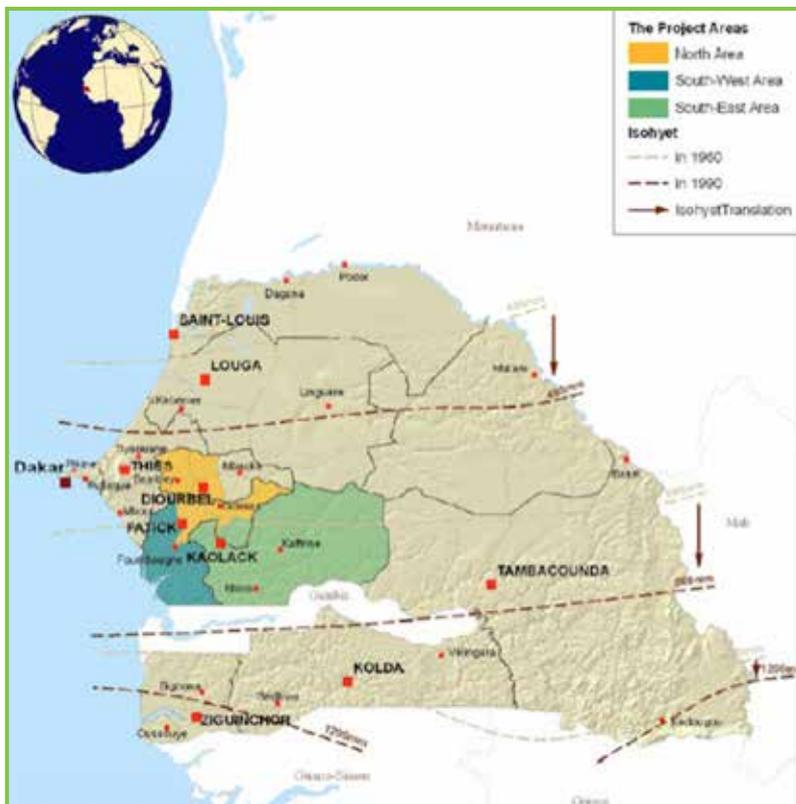
The project aimed to increase the resilience of agricultural production systems and associated value chains to climate impacts on water resources, thus ensuring the supply and availability of freshwater for agricultural use in this context of increasing water scarcity resulting from climate change and soil salinization.

The project interventions focused on three main complementary components: (i) capacity-building, awareness-raising and knowledge management at the national level; (ii) water harvesting and watershed management; and (iii) water conservation and efficient irrigation.

Capacity-building, awareness and knowledge management at the national level

This component is targeting national stakeholders, policymakers and local-level actors to create awareness of the implications of climate change on agricultural production and pastoral farming, as well as on key value chains. For example, four regional workshops were organized with the regional climate change committees to inform stakeholders about the National Adaptation Plan of Action and to better define the adaptation needs of target groups. These workshops in the Kaffrine, Kaolack, Fatick and Diourbel regions had high visibility. But sensitization also targeted producers themselves, whose confidence, especially that of young and women producers, has been restored; pleased with the results of their activities, they are now proactively articulating their needs to improve productivity.

Figure 1: Isohyet slippage in Senegal



Box 7: New rice for new livelihoods

New Rice for Africa or “Nerica” was developed by the Africa Rice Centre. Nerica encompasses a number of strains that draw on the best of African and Asian rice strains, combining the high yields of one and ability to withstand harsher climates of the other. Awa, who has benefited in the project, confirms: “With seeds that have short cycles and high yields, instead of farming many hectares, we farm a few – and still get a large production!”



©IFAD/Hiroshi Yoshino

Water harvesting and watershed management

The Government of Senegal has recognized the importance of creating water retention basins as a way to use surface water efficiently – these have therefore also been supported as an option that is particularly useful for smallholders, rather than large-scale producers.

Water conservation and efficient irrigation

This component aimed to use scarce water more efficiently through improved irrigation systems and diversified production. Drip irrigation and other appropriate and cost-effective technologies have been introduced, coupled with awareness-raising on water use and irrigation management, targeted at farmers’ organizations and communities. Improved wells have also been installed.

Environmental impacts

The project started later than anticipated, but results are already evident:

- Two pilot municipalities, Passy and Keur Samba Gueye, are being supported to integrate a climate and environment lens. The project will continue this activity and adapt to integrating climate and the environment into local investment plans, which have just been introduced instead of local development plans.

- Over 500 hectares of salinized land has been restored for rice production in four valleys in the region of Fatick, thanks to a combination of dykes and salt-tolerant species.
- 10,000 halophyte plants, which are especially adapted to salinity, have been introduced to the area to protect and rehabilitate saline fields, in partnership with the Science Institute for Agronomic Research (ISRA in French).
- Over 4,300 metres of dykes have been built as a measure against salt water intrusion, as well as containment dykes to prevent the loss of freshwater.
- Seven spillways will help channel floodwater for controlled irrigation.
- Almost 11,000 metres of bunds have been constructed to improve water retention of soils.¹⁸
- Drainage systems have been established or rehabilitated.
- Seven biodigesters have been supplied, thereby reducing pressure on forest resources.

Socio-economic impacts

- To date, 77 hectares of rice fields have been put under irrigated production to serve six farmers' organizations, benefiting 295 households.
- The project has supported certified seed production for the "Nerica" rice variety, which is well adapted to environments with less water availability, thus paving the way for more resilient livelihood options for farmers (see Box 7).
- Twenty-two kitchen gardens totalling over 70 ha have been rehabilitated, including solar equipment for 16.5 ha; 17 kitchen garden management committees have been supported, reaching 429 people, including 222 women, 116 men, 33 young boys and 58 young girls.
- Women have benefited significantly from the broader PAFA targeting approach, and concretely from initiatives targeting a reduction in their workload, such as solar energy powering pumps that extract water from wells and enable them to water their kitchen gardens; their economic empowerment has also improved, with many attracted back to abandoned kitchen gardens now better able to provide for their families: *"We have had record yields, and this allowed us to rebuild our house and buy sheep ... this project has had a very concrete impact on our lives."* (Awa, widow, and head of extended family of 21 people, including children, and president of Takku Ligguey de Taiba Cooperative).¹⁹
- Nutritional benefits have resulted from diversified production, including fish, made possible by irrigation and better water availability.

18 Stones are laid out along contour lines on both barren and cultivated lands. The stones slow down and filter runoff, thereby increasing infiltration and capturing sediment. The water and sediment harvested lead directly to improved crop performance, but also to local groundwater recharge, which can increase the water levels in wells. Source: Regreening the Sahel: Developing Agriculture in the Context of Climate Change in Burkina Faso. IFAD, 2011b.

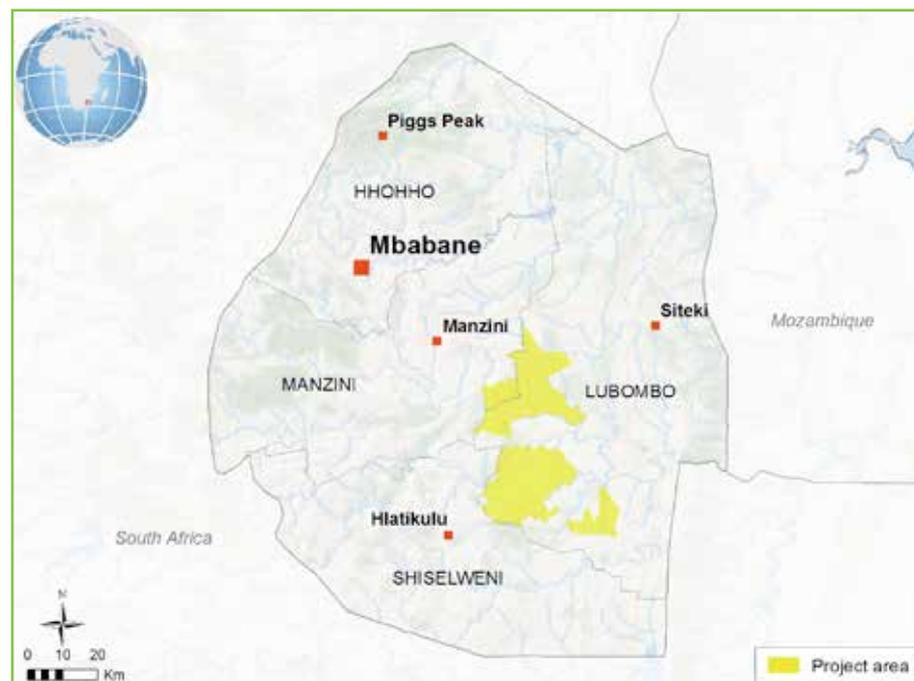
19 See "Let the Sun Shine" video (IFAD) at https://www.youtube.com/watch?feature=player_embedded&v=TrjjbWabn2o



©IFAD/Guy Stubbs

Swaziland: Grass-roots governance beats overgrazing and gully erosion

Project area



Quick facts

Project name	Lower Usuthu SLM Project (LUSLM), part of the Lower Usuthu Smallholder Irrigation Project (LUSIP)
Dates	2011-2015
Target groups	600 households, or 20,479 people
Financing	IFAD, African Development Bank, Arab Bank for Economic Development in Africa, DEVBANK, European Investment Bank, European Union, GEF, Government of Taiwan, Government of Swaziland and smallholders

Development challenge

Swaziland may be small in size, but it contains big variations in climate and landscape, with landforms embracing plateaus, hills and mountains, as well as footslopes and plains. Out of six agroecological zones, one of them, the southern lowveld is experiencing severe food insecurity in 2016 after four years of drought. The southern lowveld, in particular, also has the lowest annual rainfall in Swaziland, and rainfall patterns are highly unpredictable.

Increasing human and animal pressures have led to intensification of land use, and people are increasingly adopting unsustainable practices across semi-arid Swaziland. The main land use is extensive grazing; communal grazing and commercial ranching predominate, extending over three quarters of the country. Under the local system, each homestead can graze as many cattle as it can afford to buy – the result is overgrazing and land degradation, including changes in ecosystems, loss of biodiversity, decreases in water quality and availability. Overgrazing also removes too much of the soil's protective vegetal cover, and trampling by livestock compacts the soil so that it can hold less water. This increased run-off produces gullies in the land (see Box 8). Dwindling yields from arable cultivation and livestock lead to hunger and poverty.

Project response

The Lower Usuthu Smallholder Irrigation Project (LUSIP) is located between Siphofaneni and Big Bend in southeastern Swaziland, extending along the southern bank of the Great Usuthu River. The project is helping to tackle the food crisis and poverty by irrigating 12,500 hectares to enable smallholder farmers to transform their vulnerable rainfed subsistence agriculture to irrigated commercial cash crop production. But, as a result of the project, IFAD and the government understood that it was important to help landless people living around the LUSIP, as they stood to face greater pressure on their access to grazing lands.

GEF finance was allocated to help these land users with no land, and the "LUSIP-GEF" incremental project aimed to reduce land degradation and biodiversity loss, and mitigate climate change in the Lower Usuthu River Basin through the application of sustainable land management practices.

Box 8: Gaping gullies in Mamba Chiefdom

In Swaziland's Mamba Chiefdom lies the village of Luhlanyeni, a community of 153 homesteads in one of the driest regions in the country. When rain does fall, however, it comes in torrents. With little vegetation and unmanaged drainage, the water is channelled into gullies that become deeper each year. Gullies a dozen metres wide and several metres deep had been worrying the community for years; decades of overgrazing and poor road drainage had caused serious erosion of large areas of arable land in and around the village, which could no longer be used for cultivation. Villagers decided to take action and took to filling in the gullies with stones. At a meeting at the chief's residence for community members, the traditional authorities granted the community permission to rehabilitate and use the land for farming. They brought their concerns to the Ministry for Agriculture, and the Sihlangwini Sustainable Land Management project was established in 2010 under the LUSIP-GEF.

Source: Web article. *From Gaping Gullies to Fertile Farmland*. IFAD, 2014.

Central to this transformation was the process of fostering awareness of SLM and its importance among local people, including developing their “ecological literacy” and related practical skills. The goal was to help them better manage their natural resources. Chiefdom Development Plans (CDPs) were prepared by communities, building on ideas contributed by community members as well as technical inputs from specialists. The plans included environmental protection measures such as soil conservation, land reclamation activities, rangeland management and rehabilitation, and the establishment of conservation areas and ecotourism opportunities. The project also promoted new strategies to restore degraded lands, such as reducing herd sizes by selling old and less productive cattle, and maintaining zero-grazing feedlots where locally produced fodder and forage are available. Wherever possible, the CDPs built on local initiatives; Box 9 shows how the gullies in Mamba Chiefdom were restored as a result of chiefdom initiatives.

As well as SLM measures, alternative livelihoods and rural enterprise development were also promoted. The project supported people to undertake economic activities such as beekeeping and marketing for honey and other products at the community level. Other activities included milk production, agroprocessing and agribusiness, the commercialization of native fruits/medicinal plants, and the set up of ecotourism and leisure businesses in the area.

Environmental impacts

The main SLM achievements are as follows:

- 11 Chiefdom Development Plans were fully implemented and a further 27 are under way in follow-on projects
- SLM practices have been introduced in 68,000 hectares of land
- 50 hectares of gullied land have been rehabilitated or restored
- Water harvesting tanks and backyard vegetable gardens were established for 58 households

Box 9: Mamba Chiefdom homesteads turn sustainable land management SLM practitioners

Conserve Swaziland, an NGO with technical expertise in land rehabilitation, worked with the Mamba Chiefdom to look at the causes of gullies, possible prevention and control measures, and sustainable land management practices. The Ministry of Agriculture, the Swaziland Environment Authority and the Global Environment Facility provided training, fields tools and materials, such as gabion cages (wire baskets filled with stones used to stop erosion) and trucks for transportation. One of the solutions they learned about was the proper installation of gabion cages to prevent soil from washing away. The training was both practical and theoretical, and included farming practices to conserve water and building fencing.

A combination of biological, mechanical and people-based approaches were used to rehabilitate degraded areas. Biodiversity and natural resources were restored through conservation agriculture and tree planting. The community planted leguminous and drought-tolerant crops to increase soil nitrogen and improve vegetation cover. This increased organic matter in the soil, which is then less susceptible to erosion. It is also able to hold more water and nutrients, which makes it more fertile. They used plants with strong rooting systems, and chose edible crops because of their additional nutritional benefits. Supporting workshops on group dynamics and on HIV/AIDS were undertaken, and gender training encouraged men and women to work together.

Financial support was provided through the National Environment Fund. But the community implemented the project themselves, coming out in large numbers to participate. There were a few challenges along the way, such as the slow adoption of new practices by some community members. These farmers were invited to attend a few additional training sessions, and some were brought back in. At one point, many trees were attacked by termites, but the community applied indigenous permaculture principles to overcome them.

Source: Web article. *From Gaping Gullies to Fertile Farmland*. IFAD, 2014.

Essentially, the LUSLM has enabled vulnerable communities to transform their farming systems into sustainable productive smallholder and agropastoralist enterprises while protecting the wider ecosystem.

Socio-economic impacts

These include:

- A package of SLM-based income-earning techniques is now ready to be scaled up throughout Swaziland; it includes home gardens around fruit trees, beekeeping, indigenous chickens, roof tanks for water harvesting, haymaking and nutrition gardens
- More than 400 farmers are engaged in new livelihood initiatives, such as beekeeping, and rearing indigenous chickens
- 30 youths have become involved in beekeeping at their schools
- Formation of skilled artisans to satisfy growing demand for tanks

- A capacity development programme in SLM has reached 3,000 women and 1,400 men
- Teachers have been trained in how to integrate home gardens (using permaculture) into the national school curriculum, thereby helping young people to take over from their parents the process of restoring their lands
- Empowerment and skills upgrading of people in chiefdom homesteads to conserve soil, a precious asset

Arguably, the last point is the most important impact, as it is behind the “S” in “SLM”. Returning to Mamba Chiefdom, community member Sikelela Magagula commented: *“I have realised that it is indeed possible to rehabilitate degraded land and to use it again.”* And Nomsa Tfwala, Vice-Chairperson of the project, confirmed that, thanks to now being able to grow sweet potatoes, groundnuts and fruit trees, they can sell the peanuts: *“We no longer need to go and buy food since there is now enough from our own land!”*

Finally, people in the nearby community, Sithobelweni, came to see for themselves how it worked as they were inspired to rehabilitate a large area of their own.



©IFAD/Susan Beccio

Conclusions and next steps

The case studies in the preceding pages show that human development and a focus on the environment in drylands do not need to be in conflict. IFAD's work in drylands contributes to multiple SDGs related to alleviating poverty and empowering women and men, the climate and the environment. These "multiple benefits", contribute to multiple SDGs and include:

- Improved food security and nutrition outcomes
- Increased income for households and communities
- Better access to land for smallholders
- More awareness and understanding of sustainable agriculture approaches appropriate to drylands through local capacity development as well as research
- Valuing indigenous knowledge of drylands and protecting indigenous peoples living on them
- Empowerment of women (see Box 10)
- Stronger policy, governance and institutions
- Greater resilience to climate change

Close-up of fruit tree in Al Haouz province, Morocco.

Box 10: Expanding roles for women to restore drylands

Reducing indigenous women's workloads (China)

A joint IFAD-World Food Programme initiative, the Wulin Mountains Minority-Areas Development Project, reduced women's workloads by introducing time-saving technologies and improving drinking water supply systems, which also enhanced health. Organic farming rebuilt soil productivity, and conversion of dryland to paddies increased cash crop and food production. Small livestock husbandry provided additional income for food, school fees and clothing. The project helped increase women's self-esteem and enhanced their social position in the community.

Source: Gender and Desertification – Expanding Roles for Women to Restore Drylands. IFAD, 2010.

What next?

Today, drylands are deservedly attracting more support from many development partners, and IFAD does not work alone, but through strategic partnerships such as with the GEF, which currently contributes significantly to tackling land degradation. IFAD is proud to be the Lead Agency for the Sustainable and Resilient Food Security in Sub-Saharan Africa "Integrated Approach Program" (IAP). This GEF initiative targets agroecological systems where the need to enhance food security is linked directly to opportunities for generating global environmental benefits, and 12 countries will be supported (Burkina Faso, Burundi, Ethiopia, Ghana, Kenya, Malawi, Niger, Nigeria, Senegal, Swaziland, Tanzania and Uganda). Similarly, IFAD's Adaptation for Smallholder Agriculture Programme (ASAP) will continue its work to boost resilience and natural resource management in drylands, channelling financing from a range of donors to match that of national governments, the private sector and smallholders themselves. IFAD, for its part, will continue to invest in and advocate for drylands – their ecosystems and their people.

References and resources consulted

Note: Individual case studies are based on project documentation.

- ADB (Asian Development Bank). 2010. *Dryland Ecosystems: Introducing an Integrated Management Approach in the People's Republic of China*.
- EMG (Environment Management Group). 2012. *Global Drylands: A UN System-wide Response*.
- FAO. Undated. *Drylands, People and Land Use*.
- GEF (Global Environment Facility). 2014. *Combating Land Degradation in Production Landscapes. Learning from GEF Projects Applying Integrated Approaches*.
- GEF, IFAD. 2002. *Tackling Land Degradation and Desertification*.
- IFAD. Undated. *Desertification and Gender: Expanding Roles for Women to Restore Dryland Areas*.
- IFAD. Undated. *IFAD's Response to Climate Change Through Support to Adaptation and Related Actions*.
- IFAD. 1998. *Drylands: A Call to Action*.
- IFAD. 2000. *Sustainable Livelihoods in the Drylands: A Discussion Paper for the Eighth Session of the Commission on Sustainable Development*.
- IFAD. 2001. *Desertification as a Global Problem*.
- IFAD. 2009. *Good Practices in Participatory Mapping*.
- IFAD, 2011a. *Adaptation to Climate Variability in North-eastern Brazil's Sertão Region: Transforming the Semi-arid Zone and Facilitating Coexistence with Dry Conditions*.
- IFAD. 2011b. *Regreening the Sahel: Developing Agriculture in the Context of Climate Change in Burkina Faso*.
- IFAD. 2014. *Improving nutrition through agriculture*.
- IFAD. 2015a. *Final Report on IFAD's Hosting of the Global Mechanism of the United Nations Convention to Combat Desertification*.
- IFAD. 2015b. *The Mitigation Advantage: Maximizing the Co-benefits of Investing in Smallholder Adaptation Initiatives*.
- IUCN (International Union for Conservation of Nature and Natural Resources). 2009. *Dryland Opportunities. A New Paradigm for People, Ecosystems and Development*.
- IUCN (International Union for Conservation of Nature and Natural Resources). 2012. *Conserving Dryland Biodiversity*.
- UN (United Nations). 1994. *United Nations Framework Convention on Climate Change*.
- UN (United Nations). 2005. *Millennium Ecosystem Assessment*. Chapter 22 "Drylands".
- UNCCD (United Nations Convention to Combat Desertification). 2011. *Drylands Are Not Wastelands*. Interview with IUCN Director-General.
- UNCCD (United Nations Convention to Combat Desertification). 2013. *White Paper I: Economic and Social Impacts of Desertification, Land Degradation and Drought*.

Websites

Global Dryland Alliance

<http://globaldrylandalliance.com>

ICARDA

www.icarda.org/update/investing-agricultural-research-inclusive-and-sustainable-development#sthash.yk9AjxOP.dpbs

IFAD

www.ifad.org/en/topic/tags/desertification

UN. 2016. Website for World Day to Combat Desertification (17 June)

www.un.org/en/events/desertificationday/background.shtml

UNCCD

www.unccd.int/en/Pages/default.aspx

“Recognition of the true value of ecosystem services, and of the opportunities they offer, will enable better planning and realization of the full economic potential of dryland ecosystems, rebutting the common perception that drylands are ‘economic wastelands’” (IUCN, 2009).



International Fund for Agricultural Development

Via Paolo di Dono, 44 - 00142 Rome, Italy

Tel: +39 06 54591 - Fax: +39 06 5043463

E-mail: ifad@ifad.org

www.ifad.org

www.ruralpovertyportal.org

 ifad-un.blogspot.com

 www.facebook.com/ifad

 instagram.com/ifadnews

 www.twitter.com/ifadnews

 www.youtube.com/user/ifadTV

