IFAD
Investing in rural people

Climate-smart agriculture

A synthesis of experiences and lessons from the NEN region

Climate-smart agriculture

A synthesis of experiences and lessons from the NEN region

Originators:

Tarek Abdel Monem, Environment and Climate Programme Officer (Cairo)

Nicolas Trembley, Lead Technical Specialist, Environment and Climate

October 2022

For further information, inquiries or requests for support, contact Isabelle Stordeur, Regional Analyst, i.stordeur@ifad.org.

Contents

Abbreviations and acronyms

AMMAR	Agriculture Modernization, Market Access and Resilience project
ASAP	Adaptation for Smallholder Agriculture Programme
CSA	Climate Smart Agriculture
ECG	Environment, Climate, Gender and Social Inclusion Division
FAO	Food and Agriculture Organization of the United Nations
GALS	Gender Action and Learning System
GEF	Global Environment Facility
IFAD12	Twelfth Replenishment of IFAD's Resources
IRECRP	Inclusive Rural Economic and Climate Resilience Programme
M&E	Monitoring and evaluation
NEN	Near East, North Africa and Europe Division
SAIL	Sustainable Agricultural Investments and Livelihoods

Acknowledgements

Initially published by the Food and Agriculture Organization of the United Nations (FAO), in a publication titled *Climate-smart agriculture case studies 2021 - Projects from around the world*[1], the series of case studies reported in this publication are co-authored by the International Fund for Agricultural Development (IFAD)'s Near East, North Africa, Europe and Central Asia Division (NEN) and IFAD's Environment, Climate, Gender and Social Inclusion Division (ECG).

Updated by consultant Maria Luisa Saponaro under the supervision of Isabelle Stordeur, NEN Regional Analyst, this publication aims at presenting a deep dive into NEN experiences in Climate Smart Agriculture, and is conceived as is intended to serve as a living document for use by NEN country teams and technical experts involved in the design and implementation of IFAD-supported projects in the region and beyond. Its scope is to offer an overview of the patterns and drivers for Climate Smart Agriculture (CSA) interventions in several agroecological contexts in the NEN region.

The synthesis drew on discussions with NEN country team members, and other technical experts, who shared useful suggestions and insights for the initial draft of the report.

[1] https://www.fao.org/3/cb5359en/cb5359en.pdf

Enhancing funding and financing options

The case of Egypt: Sustainable Agricultural Investments and Livelihoods (SAIL)

Introduction

IFAD's Sustainable Agricultural Investments and Livelihoods (SAIL) project aims to contribute to the reduction of poverty and increase food and nutrition security for the poor rural women and men in "new lands" in Egypt. The project will enable small farmers in target areas to increase their income, improve their profitability and diversify their livelihoods. It will contribute to the CSA-related outcomes by reducing pressure on land and water resources, enhancing the productivity of natural resources in a sustainable way, and promoting the use of water and energy efficient technologies[2].

SAIL's three pillars are: community and livelihood development, agriculture development and diversification, rural financial services. This case study focuses on how SAIL contributes to enhancing finance options for CSA in Egypt. The project helps smallholder farmers access capital. It provides them with loans through a small and medium enterprise (SME) lending window and through microloan facilities. It helps building the resilience of communities by providing access to credit to invest in climate-smart agricultural production, livestock and off-farm small enterprises to support livelihoods diversification. The Rural Finance component of SAIL complements investments in public infrastructure and training activities supported under other components and opens up opportunities to link with a broader array of private-sector stakeholders.

The project is funded by IFAD with co-financing from the Global Environment Facility (GEF) and is implemented by the Ministry of Agriculture and Land Reclamation. With a total financing of USD 94.6 million, the project runs between 2015 and 2023.

Rationale

Egypt's water and agriculture resources are exposed to increased climate variability and growing human pressure. Future climate change will likely exacerbate this vulnerability with significant impacts including those on hydraulic and agriculture ecosystems as well as hotspot

[2] https://www.ifad.org/documents/38714170/39150184/ASAP+Egypt+factsheet.pdf/7814f148-252c-4385-99e7-6a8fbd05b733

socio-economic sectors – namely water, agriculture and health. Similarly, not less significant impacts will be expected on the poorest people in rural areas that are also the most vulnerable to climate change. The projected increase in temperature is perceived to widen the gap between water resources and demands, decrease the overall agricultural productivity, and increase the competition over natural resources. The effects of sea level rise on the coast of the Nile Delta would reduce the area under cultivation and likely reduce agricultural production. Projected future temperature rises in Egypt under climate change conditions are likely to increase crop-water requirements thereby directly decreasing crop-water use efficiency. Projected changes by 2040 show significant reductions in the yield of wheat (-12percent), rice (26 percent to -47 percent) and maize (-47 percent). The changes in crop productivity are mainly attributed to the projected temperature increase, which affects the grain filling periods and has detrimental effects on grain development stages thereby reducing grain yield and quality.

In rural areas, not only do financial services not reach the poor but the provision of services is usually hampered by the lack of appropriate loan products. Traditional loan products were not designed to address the special characteristics of agricultural lending and are not able to remove some of the constraints along the value chain. There were no special loan products for settlers on the new lands and young entrepreneurs. SAIL is scaling up the successful experience of West Nubaria Rural Development Project (WNRDP) in which farmers were given access to credit for the introduction of efficient irrigation systems. Through SAIL, most credit contributed to increased efficiency of water use, making the distribution of water more equitable, thus enhancing adaptive capacity to climate change-induced water scarcity. Credit also supports investment in solar energy pumps, solar panels for lighting among groups of farmers and construction of biogas units.

Description

The project's objective is to enable smallholder farmers to enhance their incomes, increase profitability and diversify their livelihoods. With USD 7.8 million from the GEF Special Climate Change Fund and USD 5 million from IFAD's Adaptation for Smallholder Agriculture Programme (ASAP), the project shall contribute effectively to climate change adaptation and mitigation. The project contributes to poverty reduction and food security objectives in light of the predicted negative impacts of climate change on agriculture and livestock production in Egypt. The project also focuses on increasing the climate resilience of agriculture and livestock value chains in the reclaimed lands through the adoption of efficient irrigation technologies that build adaptive capacities towards climate-induced water scarcity.

SAIL consists of three main components:

1. Community and livelihood development;
2. Agriculture development and diversification;
3. Rural financial services.

The project is a good illustration of how the five action points of CSA are interrelated. Its main interventions were informed by studies done prior to execution. For example, a detailed technical study was completed on the lining of third-level canals – *mesqas*, which is considered an adaptation action to climate change. The study identified the most sustainable materials to be used in the lining process that can withstand the area's conditions.

SAIL is carried out in close collaboration with the Egyptian government and includes capacity-building activities. For example, in March 2019, the SAIL project took an active part in the Inter-Ministerial Regional Meeting of the League of Arab States and presented the SAIL project recommendations, on behalf of Egypt, regarding climate change adaptation in agriculture sector for the region. Furthermore, the SAIL project has held 17 training sessions for representatives from relevant government and civil society institutions on climate change downscaling methodologies to analyze climate change impacts and adaptation needs in agriculture and irrigation.

The project's credit component includes loan-funded investments. Loans are provided through two main windows – small and medium enterprise (SME) lending and microloan facilities. The financial services provided by the project aim to enhance access to capital for smallholder farmers. Financial services include two different mechanisms: i) credit funds for leveraging

financial services and ii) institutional support for provision of innovative financial services. The credit line is currently channeled through the Agricultural Development Programme (ADP) and Micro, Small and Medium Enterprises Development Agency (MSMEDA).

Finally, energy-efficient technologies are implemented through the project.

Outcomes

SAIL is effectively contributing to several SDGs. Its overall goals are to contribute to the reduction of poverty (SDG 1) and increase food and nutrition security (SDG 2) for poor rural women and men in Egypt. The project is introducing and demonstrating some innovative technologies that improve the efficiency of the irrigation systems and provide alternate sources of energy for the agricultural sector to reduce its high costs and assist smallholders in adapting to climate change (SDG 13 and SDG 7). It contributes to promoting gender equality (SDG 5) and building the resilience of youth in rural areas in various ways, including through the establishment of Community Development Associations, capacity building and vocational training, and the facilitation of rural finance.

Sustainably increasing productivity. SAIL's irrigation improvement work is contributing to increasing productivity in some of the target areas. The piloting of soil-less hydroponic agriculture is an innovative technique to reduce water consumption and thus increase productivity. The project-supported FFS contributed to the promotion of adaptive agronomic systems, cropping patterns, livestock breeds and crop types and varieties. These techniques are reducing post-harvest losses and increasing the productivity of farmers in the target areas. The delivery of matching grants for 112 women has supported them to develop income-generating activities, diversify livelihoods of targeted households and improve the living standard of their families.

Enhancing resilience to the effects of climate change. The credit component of the project has opened the door for more smallholder farmers to implement adaptation and mitigation measures. The disbursement of loans started in early 2020 and as of the 31st of March, 73 percent of all SMEs loans went to the modernization of irrigation systems. These loans will help transform traditional irrigation systems into drip or sprinkler irrigation networks to help farmers adapt to water scarcity. Other loans for livestock, processing and non-agricultural

©IFAD/Mohamed Ezz Aldin

sector help communities to diversify their livelihoods and thus build their resilience to climate change impacts. While no loans have yet been disbursed for solar energy purposes, the implementation of solar pumps in the remaining years is expected to encourage farmers to apply for loans that could help transform their irrigation networks into solar powered networks.

The installation of drip irrigation systems by project beneficiaries has increased the farms' resilience to climate-induced water scarcity while achieving mitigation co-benefits through solar pumping. The project is currently lining 10.5 km of *mesqas* and thus improving water management for 817 feddans (approx. 341 hectares) through reducing water loss. The project also established five meteorological stations as part of an Early Warning System for Climate Change in the five target regions. The stations are operating through collecting, processing and providing weather related information in a centralized manner. The drainage improvement works that serve 2000 *feddans* (approx. 840 hectares) in Upper Egypt has helped support the water management system and increase their resilience to water scarcity.

Reducing Green House Gas emissions. The project adopted the introduction of renewable energies in water pumping systems as well as the post-harvesting and processing equipment. The project introduced solar pumping units in some targeted areas, which increased energy efficiency and replaced diesel as the main energy source for pumping. In addition, the project promoted biogas units as a renewable source of energy for domestic use. Capacity building activities included workshops on recycling and re-use of waste in composting.

Enhancing agricultural resilience to climate change by developing inclusive climate-smart value chains

The case of Georgia - Agriculture Modernization, Market Access and Resilience project (AMMAR)

Introduction

IFAD's Agriculture Modernization, Market Access and Resilience (AMMAR) project in Georgia (2015−2021) provided a substantial contribution to the development of inclusive climate-smart value chains in the country. The project – which focused on smallholder farmers and rural enterprises – contributed to enhancing the resilience of Georgia's agriculture sector to climate change and boosted private investments. It mainstreamed a climate-smart approach throughout its various activities, which include the development of irrigation and value chain infrastructures, the restoration of landscapes through the expansion of windbreak surfaces, the facilitation of policy dialogue on climate-resilient value chains, the creation of demonstration plots and the provision of CSA training. The project was financed with an IFAD loan and grant, GEF grants, contributions from the Government of Georgia and private investments from farmers and agribusinesses. The AMMAR project was executed by the Georgian Ministry of Environmental Protection and Agriculture, and was implemented by the Rural and Agricultural Development Fund.

Rationale

The agriculture sector in Georgia is highly vulnerable to climate change and climate variability, leading to serious problems of production loss and threats to food security under a business-as-usual scenario. Recent extreme weather events (including floods, windstorms and drought) have contributed to a marked trend of land degradation throughout the country, as well as shifting aridification trend that is poised to heavily affect the already semi-arid eastern portions of Georgia by the end of the century. Smallholder farmers in the country are highly sensitive to climate change due to their heavy reliance on subsistence agriculture. Their limited access to financial resources and technologies and limited adaptation knowledge results in a low

adaptive capacity and higher vulnerability to extreme events, unpredictable climate variations and environmental degradation caused by the combined effects of anthropogenic factors and climate change. Against this backdrop, the AMMAR project aimed to address urgent climate resilience challenges as part of the Ministry of Environmental Protection and Agriculture's substantial ongoing investments to modernize agriculture in Georgia. The project was fully aligned with the country's Strategy for Agriculture Development and its supporting action plan and was designed as a progressive investment in the modernization of agriculture. It remained fully aligned with the two Strategic Objectives (SOs) of the 2019-24 IFAD's Country Strategic Opportunity Programme (COSOP), namely "Creating economic opportunities for the productive poor" and "Establishing an enabling environment for an adaptable, sustainable and inclusive rural economy".

Description

The project activities were carried out under two mutually supportive components, Component 1: irrigation and agricultural value chain investment, and Component 2: climate-smart agricultural and value chain development) to accelerate the development of up to six priority CSA value chains. The priorities and needs of the target groups were addressed through both hard investments to upgrade public and private productive assets and infrastructure, and 'soft' interventions in the form of technical support, entrepreneurship capacity building, facilitation of market linkages and policy support, all meant to foster agricultural production systems adapted to ongoing climate changes. Indeed, the AMMAR project mainstreamed a climate-smart approach throughout its activities, with support from the GEF grant.

Under Component 1, the project screened and prioritized product value chains offering sustainable comparative advantages under future climate change scenarios, especially at the primary production level. The project also promoted investment in efficient irrigation technologies, climate adaptation systems and the construction of windbreaks as a targeted landscape restoration and soil erosion control measure, alongside sensitive farmland areas and rehabilitated irrigation schemes to create sustainable improvements in water-efficient irrigated production. The project contributed to the widespread adoption of climate-smart good agricultural practices and technologies at the farm level.

Under Component 2, CSA technologies for improved water, soil and nutrition were transferred to the beneficiaries. Technology was transferred and promoted at the village level through a

combination of CSA demonstration plots, promotion events, short and longer practical field training and systematic follow-up with farmers by the local service providers delivering the training. CSA demonstration plots enabled farmers to directly access know-how, training and networks of service and credit providers, and thus facilitated the adoption of the promoted technologies. They also allow interested farmers to get an objective farmer perspective on the technologies from the progressive farmers on whose land the CSA demonstration plots were established.

©IFAD/Mohamed Ezz Aldin

Implementing practices at field level. The AMMAR project promoted CSA practices by establishing demonstration plots in collaboration with selected lead farmers. Data on demonstration plots recorded by lead farmers and service providers supported the assessment of the economic benefits and impact of the demonstrations. The project organized trainings and exchange visits to demonstration plots to promote good practices across

Georgia. A total of 3 079 ha of land were brought under climate-resilient practices, which is 154 percent of the target 2 000 ha set at MTR. This figure refers to the surface under landscape restoration sites established by the project. River bank protection interventions in Kakheti have locally restored 320 ha of agricultural land and 2 759 ha of land turned out to be under protection from wind erosion after the establishment of pilot 53.1 km long windbreaks. The windbreaks planted correspond to 234t of CO2 equivalent Green House Gas (GHG) reduced and potentially provides habitat for more than 1,000 animal species. In total, 90,000 trees were planted, of which 45,000 (50%) are protected with photodegradable plastic tubes, covering 36 ha of the state lands rather adjacent to the private lands of beneficiary farmers in five vulnerable municipalities of Shida Kartli and Kakheti regions. The production capacity of the four nurseries established under the Project equals 250,000 seedlings per year, that can be used for future plantations in Georgia.

More than 14 300 ha of land (including more than 8 480 ha under the Iakublo dam) benefitted from new-built or rehabilitated water-related infrastructure, thus contributing to improve management of water resources, reduce operation/exploitation costs, eliminate water losses, stimulates private investment from the side of farmers and agribusinesses. Farmers are currently informally organized to manage water resource and these developments will also contribute to improve collective water management and potentially support the creation of Water Users' Organization (WUO).

Enhancing financing options. The project promoted access to financial services through its small grants. By its completion, the project achieved a total of 591 small grants, exceeding the 220 target (269 percent achievement). Unlike for other grant facilities implemented in Georgia by other development agencies, there was no minimum threshold to apply for a grant under the project; the project thus managed to attract even small investors. Grants proposed by the AMMAR project resonated very well with youth: they enable youth to implement new business ideas that they had in mind and but could not realize.

Supporting the creation of enabling policy frameworks. Based on the experiences regarding CSA, including the construction of windbreaks, the AMMAR project supported the elaboration of windbreak management plans (based on international best practices) and enforcement packages to strengthen Georgia's existing legal and policy framework on windbreaks and soils. These plans and packages represent an incentive for the further elaboration of the country's laws and projects.

Strengthening national and local institutions. The AMMAR project organized training of trainers in efficient irrigation technologies and CSA technologies. These training sessions targeted service providers and regional staff of the Ministry of Environmental Protection and Agriculture. These activities reached their target of training more than 50 trainers, who improved their capacities and abilities to support the implementation of the project on the ground.

Linking to SDG goals. The development goal of the project was to sustainably increase incomes and reduce poverty for women and men in rural Georgia (SDG 1). The development objective of the project was to stimulate investment in climate-smart agricultural value chains to increase incomes and strengthen the resilience of small farmers (SDG 13). The project promoted climate adaptation to regenerate soils, for example by using compost and vermicompost and planting windbreaks of local tree species (SDG 15).

Overall, the project contributed to:

- Increasing productivity: Agricultural productivity is improved as a result of various interventions of the project, including the rehabilitation of irrigation canals to boost the availability of irrigation water, the improvement of CSA practices, the strengthening of market linkages and targeted investments to boost farm production (greenhouses, drip irrigation, mechanization, quality seedlings, etc.).
- Enhancing resilience: The project enhanced environmental sustainability by improving irrigation practices and soil and nutrition management at farm level, and thus boosting the resilience of Georgia's agriculture sector. A survey into the project's outcomes for targeted households, carried out during project implementation, revealed that 48 percent of the beneficiaries of climate-smart grants reported that the quality of their harvests was better in 2018 than in 2016, compared with only 6 percent in the control group. The survey also showed that 30 percent of the households targeted by irrigation activities believed that the quality of their harvests had improved in 2017/18, against only 6 percent in the control group. The farmers that were targeted by the project irrigated a wider range of crop varieties than the control farmers. Climate-smart practices that improve soil resilience led to higher productivity and crop diversification, which has a positive effect on food security. The final impact study reveals that 98 percent of the overall beneficiaries in the target irrigation areas have now access to

water, vs. 73 percent in the control group, and the February 2021 panel survey shows that 48 percent of the respondents have increased their cultivated land area since 2018, with an average increased agricultural productivity of 8 percent across all types of crops benefitting from improved irrigation systems.

- Reducing GHG emissions: The AMMAR project has promoted sustainable agricultural production practices to help preserve soil and water resources, for example by proposing efficient irrigation techniques. The project proposed adaptation technologies featured in the GEF/UNEP Guidebook for climate change adaptation in agriculture. In particular, the project promoted the use of pressurized irrigation systems (sprinkler or drip) to improve water management and efficiency, as well as the adoption of climate adaptation systems (combining practices such as reduced or zero tilling, soil mulching, vermicomposting, crop rotation and diversification, and integrated nutrient and pest management) to improve soil fertility and soil carbon and water storage. The resulting reduction in the use of fossil fuels and increase in soil carbon has an important mitigation effect.

AMMAR achieved its overall goal to sustainably increase incomes and reduce poverty for women and men in rural Georgia. The project reached a total of 17 016 households (170 percent of initial target), involving 45 045 persons receiving direct services from the project across all regions of Georgia.

Positive outcomes are noted across the two components, with 71 percent households reporting adoption of new or improved inputs, technologies or practices (against a target of 50 percent), 77 percent of matching grant beneficiaries having increased their income by an average of 8 percent (against a target of 50 percent), and a value of private investment in inclusive value chain for farmers and agribusinesses of over USD 12 million (against a target of USD 9 million).

Promoting conservation agriculture through policy engagement and capacity building for smallholder farmers

The case of Moldova - Inclusive Rural Economic and Climate Resilience Programme (IRECRP)

Introduction

Moldova's National Strategy for Agricultural and Rural Development (SNDAR) 2021-2030 acknowledges that the agriculture sector not only plays an economic role, but also environmental and social roles. The strategy recognizes the challenges faced by agriculture today, including price volatility, climate change and rural poverty. It identifies climate change adaptation priorities for the agriculture sector, and aims to ensure that Moldova's agricultural products comply with the European Union's requirements for food security and safety. IFAD's country strategic opportunities programme (COSOP) for Moldova (2019-2024) aims to build resilient livelihoods in marginal rural areas by promoting CSA and economic diversification, and improving talent retention and access to rural finance.

The recently closed Inclusive Rural Economic and Climate Resilience Programme (IRECRP) (2013-2021) aimed specifically to deliver on the opportunity of climate change innovation identified in the COSOP for Moldova. IRECRP promoted CSA to enhance the adaptive capacity of especially small-scale farmers in locations that are increasingly susceptible to climate shocks. The programme combined the creation of an enabling policy environment, the strengthening of capacity of local national institutions and stakeholders, and enhancing farmers' access to finance and implementing conservation agriculture practices.

IRECRP was jointly funded by IFAD, Denmark's development cooperation (DANIDA), GEF and the Government of Moldova and run from August 2014 to March 2021.

Rationale

IRECRP was formulated based on the current and expected effects of climate change in Moldova. As evidenced by recent studies, the agriculture sector in Moldova is highly exposed to climate change and climate variability. Under a business-as-usual scenario with increased frequency and severity of climatic events (and particularly droughts), this leads to serious problems of production losses and threats to food security. Smallholder farmers in Moldova

are highly sensitive and vulnerable to climate change due to their heavy reliance on subsistence rainfed agriculture. Their limited access to financial resources, technologies and adaptation knowledge results in a low adaptive capacity and higher vulnerability to extreme climatic events, unpredictable climate variations and environmental degradation caused by climate change. IRECRP has been designed to address the impacts of climate change and identify the adaptation priorities of the Moldovan government for the agriculture sector.

Description

IRECRP was the sixth IFAD programme in Moldova. The programme built on previous IFAD investments in conservation agriculture, value chain development, infrastructure, financial services and capacity building. Its main objective was to improve the ability of the rural poor to cope with the vagaries of climate change and increasing economic volatility.

The climate change resilience and inclusive value chain development component of IRECRP was designed to contribute to the creation of an enabling policy environment by triggering a policy process to boost the adoption of conservation agriculture (CA). This was be achieved by mainstreaming climate adaptation into rural development planning, supporting small-scale private agro-forestry investments, enhancing institutional capacities and improving the policy environment for climate resilient agriculture and soil protection. Policy engagement in climate adaptation specifically remained marginal, as IRECRP proved to be very effective at helping Moldova's National Commission for Financial Markets draft regulations on licensing for saving and credit associations and establish internal procedures for identification, recordkeeping and risk management in this sector. The programme also funded the development of the National Irrigation Development Strategy, contributed to the development of the National Strategy for Agriculture and Rural Development (2021–2030), and provided support to competent authorities' staff on new EU Regulation on organic production.

IRECRP contributed inter alia to strengthen stakeholders' capacities to mainstream climate change adaptation activities, such as for example sylviculture, cultivating shelterbelts trees. To this end, workshops and study tours were organized. According to the PCR, the programme's overall success at building the capacities of national institutions to mainstream climate adaptation and climate change activities was limited. However, the programme has reportedly exceeded its targets for the training on climate-resilient agriculture of farmers and farmers' organizations (mainly through FFS). A set of recommendations on training,

awareness raising on climate change adaptation and mitigation, and the mainstreaming of climate change contributed to improve the technical knowledge of the personnel of national institutions and of project staff. These capacity building activities are being continued and strengthened by the new IFAD programme for Talent Retention for Rural Transformation. This programme aims to further strengthen in-country capacities for the promotion of climate-resilient and conservation agriculture through the development of a national climate adaptation curriculum, the creation of scholarships, research, consultations and dissemination of key lessons, with a strong focus on smallholder farmers.

IRECRP also improved farmers' access to financial services by giving out small grants for the procurement of climate-resilient agricultural equipment. In the context of Moldova, where farming is subject to a gradual process of consolidation and commercialization, the programme successfully targeted smallholders with a combination of grants and loans, which were relevant to smallholders. In addition, by supporting savings and credit associations and focusing on young entrepreneurs, IRECRP was able to target the relatively smaller farmers among smallholders.

Outcomes

IRECRP contributed to multiple SDGs. The development goal of the programme was to enable poor rural people to raise their incomes and strengthen their resilience (SDG 1), promote inclusive rural economic development and create employment (SDG 8). The programme promoted climate adaptation practices to regenerate soils (SDG 15) and climate-smart irrigation techniques to strengthen farmers' resilience and capacity to adapt to climate-related hazards and natural disasters (SDG13).

Overall, IRECRP exceeded its targets in terms of the number of beneficiaries reached and the involvement of women. Overall, IRECRP brought more than 27 000 ha of land under climate-resilient practices[3] and helped nearly 9 000 smallholder household members cope with the effects of climate change. At completion, IRECRP had brought 104 ha of farmland under sustainable irrigation, thereby reducing the vulnerability of the agricultural supply to natural hazards.

IRECRP contributed to the first pillar of CSA i.e. sustainably increasing productivity. Annual impact assessments highlight that the farmers involved in IRECRP reported productivity gains across the years. At completion, 48 percent of the beneficiaries of infrastructure schemes, youths and micro-entrepreneurs indicated an increase in production. The 2021 PCR indicates that of the 321 beneficiaries of climate adaptation training, 93 percent reported high importance of the training sessions. It is worth noting that while drought is by far the main challenge, 70 percent of respondents have reported increased soil humidity levels in direct relation to their adoption of CA technologies, which helps them maintain acceptable yields during increasingly frequent drought occurrences. More than 50 percent of respondents apply CA (mini-till 76 percent, no-till with 46 percent and only 8 percent strip-till).

CSA's second pillar of enhancing resilience is embedded in IRECRP's overall goal, which is precisely to enable poor rural people to raise their incomes and strengthen their resilience. The programme promoted innovation as an answer to climate change, with a dedicated component aimed at promoting the adoption of CSA practices to enhance the adaptive capacity of especially small-scale farmers in locations that are increasingly susceptible to climate shocks. A grant of USD 4.26 million provided by GEF funds more than 65 percent of the programme's component on climate change resilience and inclusive value chain

[3] Project completion report: https://www.ifad.org/documents/38711624/40330956/Republic+of+Moldova+1100001669+IRECR+Project+Completion+Report.pdf/73ed9c2e-995b-d767-608d-56a09808be0a?t=1634662103939

development. The programme reached over 200 percent of its target beneficiaries and achieved a good geographical spread of interventions across Moldova. As a consequence of the programme's activities, the area under climate adaptation in the country has increased, as farmers have gradually accepted climate adaptation techniques as a viable option to deal with climate uncertainty and change. Overall, survey data show that the adoption of climate adaptation technologies led to improvements in comparison with baseline data in terms of both yields and profitability. Farmers who have invested in shelterbelt protection and in the rehabilitation of grasslands, for example, have reported a positive impact on their productivity.

CSA's third pillar, i.e. the reduction of GHG emissions is also embedded in the results of this programme. The promotion of climate adaptation in Moldova directly led to a reduction in the use of fossil fuels and an increase in soil carbon. Even though there have been no instruments under the IRECRP to directly monitor the effective reduction in GHG emissions resulting from the implementation of the programme in the field, it is clear that the climate adaptation activities promoted by the programme have resulted in an important mitigation effect.

Mapping climate-smart agricultural practices of rural women

The case of Somalia: Expanding the evidence base

Introduction

A 2019 study aimed at building the evidence base for CSA identified the planting of trees to conserve soil and water resources, the cultivation of drought-resistant crop varieties and the raising of mixed herds as just 3 of more than 80 CSA practices applied by rural women in Somalia. IFAD funded the study to guide the design of its agricultural programmes aimed at helping crop and livestock farmers adapt to climate change.

Rationale

Somalia increasingly suffers from the effects of climate change, as drought and floods ravage the conflict-prone country in growing intensity and frequency. The Notre Dame Global Adaptation Initiative lists Somalia as one of the countries that are most vulnerable to climate change and least prepared to adapt to its effects (University of Notre Dame, n.d.).

There is little literature on women's engagement in agriculture in Somalia, and not much is known about the CSA practices they apply. This is why IFAD funded a study aimed at identifying the CSA practices of rural women in Somalia. The study provides an evidence base for future IFAD-funded projects by identifying CSA practices that are effective at improving the livelihoods of poor smallholder households in Somalia.

Description

The study described in this chapter was undertaken in 2019 by the Somali Disaster Resilience Institute, a national research institution based in Mogadishu. The institution carried out an extensive literature review, engaged with over 120 rural women through focus group discussions and interviewed 20 experts. Information was collected on CSA practices in five states: Hirshabelle, Jubaland, Mudug, Puntland, and South West.

The study is part of IFAD's wider programme of work in Somalia. Since the 1980s, IFAD has invested a total of USD 140 million in agricultural development projects in Somalia, reaching 1 780 000 direct beneficiaries. The organization has three ongoing projects in the country that promote the adoption of climate-smart farming technologies, improved food security and nutrition, as well as the sustainable management of water, watersheds and rangelands, and small ruminant and livestock development.[4]

IFAD is committed to increase its finance to support smallholders adapt to the effects of climate change. The organization aligns its programmes to the targets on climate change mitigation and adaptation set by countries in their NDCs to the Paris Agreement.

[4] The three projects are entitled:
- Resilient livelihood action to COVID-19;
- Food security and sustainability in fragile situations in Puntland; and
- Productivity enhancing technologies to improve pastoralists and agro-pastoralists livelihoods in dry lands in Somaliland.

Outcomes

Study findings. The study helps fill a knowledge gap by identifying over 80 CSA practices. A compendium provides short descriptions of over 60 practices, classified into seven major categories (crops, livestock, energy, soils, water, forestry and aquaculture) with various subcategories. Many of the practices fit in with the three pillars of CSA. They have the potential to increase productivity and incomes, enhance resilience and adaptation, and reduce GHG emissions.

The findings of the study demonstrate the potential to change agricultural practices to reduce farmers' vulnerability to the effects of climate change. Most of the CSA practices applied by rural women concern crop production. Practices with a strong potential to increase production and resilience include the use of indigenous crop varieties that resist droughts and diseases, practising crop rotation to keep soils fertile, and using traditional methods to store seed. Several farmers said that they listened to weather forecasts on the radio to time the preparation of their fields. This finding suggests that the radio is a good way to disseminate information on CSA practices.

None of the women included in the study engage in nomadic herding, which is considered a job for men. However, women take care of livestock around the homestead. They feed their animals by fencing off land for grazing, growing fodder crops such as alfalfa and Sudan grass, and collecting wild fodder plants. Such adaptive practices help farmers cope with dwindling grassland resources due to drought.

The study revealed different perceptions of gender roles. Some women argued that irrigation is the responsibility of men, while others said that both women and men undertake tasks linked to irrigation. Irrigation enables farmers to grow food during the off-season and in times of drought.

Several focus groups ranked agricultural practices according to their importance for the community. For example, focus groups in Galkayo ranked herd and grazing management, water storage and fodder production as their top priorities.

Many practices with the potential to increase the resilience of households are not applied. Several groups were aware of soil conservation practices such as erosion control measures and conservation agriculture, but stated that these are rarely applied.

The study further identified various constraints that hinder the wider adoption of CSA practices. Discussion groups highlighted the need for training, and argued that essential services − such as extension or veterinary services − are lacking. Interviews with experts revealed that rural women are often excluded from decision-making processes, are not allowed to possess fixed assets and do not hold the required financial capital.

Designing gender-sensitive projects to increase resilience. The study findings are of great value for organizations such as IFAD that fund agricultural projects in Somalia, especially in their efforts to promote progress towards achieving SDG 1 (No poverty) and SDG 2 (Zero hunger). It is important to leverage the current evidence base for CSA to provide information for future projects.

The study confirms that IFAD programmes should support rural women as a key target group to work towards SDG 5 (Gender equality). Women have important and diverse roles in agriculture and are key players in rural households in terms of adaptation to climate change. As cultural norms may hamper the participation of women in projects, project designers should consider using specific methodologies to target women farmers, such as the gender action and learning system (GALS).[5]

Agricultural projects that target female crop and livestock farmers should acknowledge the wide range of CSA practices that already exist. Interventions should build on existing good practices, improving them and promoting them across the country. This study specifically recommends investing in scaling up innovations related to solar energy, biogas, seed banks and food storage technologies. It also identifies training and the provision of rural finance as key mechanisms to promote CSA practices. These types of interventions help achieve SDG 13 (Climate action).

Project designers should be aware of the fact that farmers in different regions prioritize different CSA practices; they should therefore be flexible in the selection of CSA practices to promote. The study also shows that project teams that implement activities need technical expertise on different subject matters, ranging from crop production to energy management.

[5] For more information on GALS, see for example https://gender.cgiar.org/gals-for-qualitative-research/.

Conclusions

Addressing climate change and transforming agri-food systems are key to meeting the Sustainable Development Goals (SDGs). With between 720 and 811 million people around the world facing hunger today[6], agri-food systems emitting one third of global anthropogenic GHG emissions[7] and a growing public demand for climate action, it is pressing to achieve food security while adapting to - and mitigating - climate change.

CSA is an integrated approach to managing landscapes—cropland, livestock, forests and fisheries—that addresses the interlinked challenges of food security and accelerating climate change. CSA has grown from a concept into an approach implemented throughout the world, by all types of stakeholders.

This publication describes a series of CSA case studies discussing context-specific activities that contribute to CSA's three outcomes:

1. Increased productivity: Produce more and better food to improve nutrition security and boost incomes, especially of 75 percent of the world's poor who live in rural areas and mainly rely on agriculture for their livelihoods.
2. Enhanced resilience: Reduce vulnerability to drought, pests, diseases and other climate-related risks and shocks; and improve capacity to adapt and grow in the face of longer-term stresses like shortened seasons and erratic weather patterns.
3. Reduced emissions: Pursue lower emissions for each calorie or kilo of food produced, avoid deforestation from agriculture and identify ways to absorb carbon out of the atmosphere.

Many of the case studies presented in this report pay special attention to smallholder farmers, including women and indigenous groups, who are particularly affected by the impacts of climate change. While the results of some of the cases are yet to fully unfold, there is scope to define and analyse their core features, identified in different agroecological contexts and the measures adopted to either duplicate/scale up successes or tackle the challenges encountered in their implementation. This catalogue is intended to be a living document, where NEN experiences in this domain and related progress may continue to be recorded.

[6] FAO et al., 2021, The State of Food and Agriculture. Rome.
[7] Crippa, M., Solazzo, E., Guizzardi, D., Monforti-Ferrario, F., Tubiello, F.N. & Leip, A. 2021. Food systems are responsible for a third of global anthropogenic GHG emissions.

International Fund for Agricultural Development
Via Paolo di Dono, 44 - 00142 Rome, Italy
Tel: +39 06 54591 - Fax: +39 06 5043463
Email: ifad@ifad.org
www.ifad.org

facebook.com/ifad
instagram.com/ifadnews
linkedin.com/company/ifad
twitter.com/ifad
youtube.com/user/ifadTV