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LESSONS LEARNED AND GOOD PRACTICES IN NATURAL RESOURCE MANAGEMENT

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ACRONYMS

ADAPT!	Adapt for Environment and Climate Resilience in Sudan
AFD	French Development Agency
ARC	Agricultural Research Corporation
BIRDP	Butana Integrated Rural Development Project
DFID	United Kingdom's Department for International Development
FAO	Food and Agriculture Organization of the United Nations
FNC	Forests National Corporation
FOB	Free On-Board
GAPAs	Gum Arabic Producer Associations
GCF	Green Climate Fund
GoS	Government of Sudan
IFAD	International Fund for Agricultural Development
IWRM	Integrated Water Resources Management
MENRPD	Ministry of Environment, Natural Resources and Physical Development
MIS	Market Information System
NCE	National Council for Environment
NRM	Natural Resource Management
OECD	Organisation for Economic Co-operation and Development
RPGD	Range and Pasture General Directorate
SDG	Sudanese Pound
SSGASS	Support in Structuring the Gum Arabic Sector in Sudan Project
UNAMID	United Nations - African Union Hybrid Operation in Darfur
UNEP	United Nations Environment Programme
UoK	University of Khartoum
WEK	Wadi El Ku Catchment Management Project
WSRMP	Western Sudan Rangelands Management Project
ZOA	Dutch Non-Governmental Organisation

THE ADAPT! PROJECT

Sudan's people and ecosystems are under increasing pressure from rapid population growth, overuse of scarce water resources, deforestation and land-grabbing. Climate change and variability aggravates these stresses.

The United Nations Environment Programme (UNEP) and the Government of Sudan (GoS)[1], in collaboration with the United Kingdom's Department for International Development (DFID), are implementing a project that seeks to influence transformative change for the environment in Sudan.

By elevating the environment as an issue and engaging a wide range of audiences in strategic sectors, the ADAPT! project will have a lasting impact on people's lives in Sudan.

The expected project outcomes are:

1. Integration of good practices for environmental management, governance and climate resilience into humanitarian and development projects.
2. Utilization of country- and sector-specific environmental data by practitioners and policymakers for strategic planning and decision-making.
3. Improvement in policies and institutions.

Climate change and land degradation are becoming real threats to Sudan. Overgrazing is one of the main factors contributing to environmental degradation in the country. © David Jensen, UNEP

1. Sudan's Ministry of Environment, Natural Resources and Physical Development (MENRPD) was UNEP's government counterpart, which has been replaced by the National Council for Environment (NCE) in the ex-political structure of the Government of Sudan (GoS) in 2018.

INTRODUCTION

Development planners and practitioners in Sudan have supported many projects on better Natural Resource Management (NRM) since the 1960s. However, lessons learned have often not been documented and properly communicated. Project reports tend to get lost and lessons learned are forgotten. Many practitioners shy away from reading lengthy reports (Hamid, 2017).

The lack of learning and communication of good practices undermines the effectiveness of development funding. The United Nations Environment Programme (UNEP), the International Fund for Agricultural Development (IFAD), the Food and Agriculture Organization of the United Nations (FAO), the Forests National Corporation (FNC), the Ministry of Agriculture and Forestry, the Range and Pasture General Directorate (RPGD), the Ministry of Livestock, Fisheries and Wildlife and other partners wish to facilitate the exchange of lessons learned (Abdel Majid, 2017).

The first step of the process was made in May 2017, with the collection of available documents from 16 partners throughout Sudan, mostly for the period 2012–2017.[2] The lessons learned, and good practices published in these documents were then incorporated into four themes. The second step was to distribute four summaries to all partners. The third step, in November 2017, was to organize a workshop for practitioners dealing with lesson learning in their organizations. Finally, comments and recommendations made during the workshop were incorporated and draft themes were reviewed. In 2018, the four themes were translated into Arabic, printed and then disseminated in Sudan to NRM practitioners for further review and later finalised in 2019 by incorporation of comments and suggestions. The four themes are on:

1. Supporting livestock corridor management.
2. Registering and managing forests and rangelands.
3. Providing support to smallholder gum arabic farmers.
4. Developing synergy between Integrated Water Resources Management and Natural Resource Management.

The Organisation for Economic Co-operation and Development (OECD) defines lessons learned as "Generalizations based on evaluation experiences with projects, programs, or policies that abstract from the specific circumstances to broader situations" (OECD, 2002). The four themes mentioned above therefore attempt to generalize location-specific project conditions into the larger Sudan context.

2. The contributing organizations are (in alphabetical order): the French Development Agency's (AFD) Gum Arabic Sector in Sudan Project (GASS), the Agricultural Research Corporation's (ARC) Forestry Research Division, the Butana Integrated Rural Development Project (BIRDP), the East Nile Catchment Water Management Project, the East Darfur Natural Resrouce Management (NRM) Project, the Food and Agriculture Organization (FAO), the Forest Carbon Sequestration Project, the Forests National Cooperation, the International Fund for Agricultural Development (IFAD), the Practical Action, the Range and Pasture General Directorate (RPGD), SOS Sahel, the United Nations Environment Programme (UNEP), the Sudan Sustainable Natural Resource Management Project, the University of Khartoum's (UoK) Forestry Faculty, the Wadi El Ku Catchment Management Project (WEK), the Western Sudan Rangelands Management Project (WSRMP) and ZOA.

LESSONS LEARNED

The cross-cutting lessons learned apply to the four themes. In fact, many are so general that they may apply to most rural development sectors such as agriculture, water and education.

1. ASSESS GOOD PRACTICES

A good practice one year may not be so good years later and may even become a bad practice. One example is the introduction of mesquite trees in the 1960s. It was considered a good practice at the time to combat desertification. This changed in the 1980s when it spread in eastern Sudan and was considered an invasive species to be eradicated. This example shows that what can be considered a good practice somewhere may also be considered a bad practice elsewhere. One project presentation during the November 2017 workshop used mesquite growth as an example of how to fix sand dunes to protect valuable cropland. In another presentation, mesquite was considered a pest. Therefore, the generalization of lessons learned to the whole of Sudan may not always be possible (Abdel Majid, 2017).

Critical evaluation of what works and what does not, under what conditions, is constantly required. For example, livestock corridor management is generally accepted as a good practice to manage pastoral-farmer relations. However, projects rarely take soils into account. Frequent livestock passage on heavy Gardud soils (depleted marginal sandy soils) leads to compaction and soil degradation. It may be impracticable to avoid crossing Gardud soils, but local negative impacts should at least be considered for all good practices. It is therefore important to critically assess good practices under local conditions (SOS Sahel, 2012; RPGD, 2013).

Vegetation protects agricultural land against sand dunes: mesquite has positive or negative effects, depending on the situation. In the case of floodplains such as the Gash, the effects can be disastrous for local farmers and water users. © Albert Gonzalez Farran, UNAMID

2. CONSIDER DIFFERENT SECTORS

All good practices should consider the impact across different sectors. For instance, it is important to formulate good practices for hafir[3] (hand dug water depression) construction and guarantee good hafir governance after construction. However, as a result of a hafir, livestock pressure may greatly increase and lead to range degradation in the wider environment. In that case, governance should cover the hafir (water sector) and also the wider environment such as rangeland (Elhag et al., 2012).

Livestock production resource planning – corridors, pasture, forest, water points, animal health care – requires planning pastoral and local livestock production in ways that satisfy all stakeholder groups. © UNEP

3. IDENTIFY LONG-TERM SOCIOECONOMIC BENEFITS AND COSTS

Models of good practice are usually presented in terms of benefits. Many projects highlight benefits in physical terms, for instance "low crop yield" before the project versus "high crop yield" after the project. This is not convincing. Most changes also have cost implications. The costs of investment and maintenance should be clear, in addition to the benefits, and the ratio of costs and benefits should be attractive. The distribution of costs and benefits over the stakeholders should be acceptable, with particular emphasis on women. If not, sustainability cannot be achieved (Roy Behnke Odessa Centre, 2012).

3. A hafir is a traditional rainwater storage reservoir.

4. OVERCOME LIMITS TO EFFECTIVE PARTICIPATION OF WOMEN

The principle of women's participation in project planning and implementation is widely accepted and includes decision-making. However, for many projects, it is difficult to put the principle into practice. The constraints are often cultural in terms of project target groups, or engrained habits in usually male project staff. Furthermore, there may not be any female presence at decision-making levels such as steering committees. Even if women are present, they may not participate actively. Much more needs to be done to achieve real, high-quality participation of women in many projects (Abdel Majid, 2015).

Effective women's participation in planning, decision-making and economic development may require consultation in specific women's group settings, in addition to having female staff on projects. © Dimah Gasim, UNEP

5. IDENTIFY THE APPROPRIATE IMPLEMENTATION SCALE

Project operations across states add complexity during implementation. It was difficult for the East Nile Watershed Project to work across three states, and for the Western Sudan Resources Management Program (WSRMP) to organize interstate corridors. On the other hand, the Butana Integrated Rural Development Project (BIRDP) works across the five Butana states and intends to develop a regional strategy. Practical implementation is best achieved within state administration boundaries. However, collaboration among projects throughout Sudan is necessary to achieve better policies at the national level. This means working together across project boundaries (Abdel Majid, 2017).

6. BALANCE THE ROLES OF LOCAL KNOWLEDGE AND SCIENCE

Local knowledge is always important and combining local knowledge and science can provide an important added value. For instance, in Integrated Water Resources Management, local institutions are essential for water monitoring and negotiation, and science is essential for water modelling. The Niger river countries have achieved consensus on water distribution among countries because water science has played a major role. Science has also proved important in gum arabic support in Sudan (FAO, 2014; FAO, 2015).

7. SUPPORT INSTITUTIONAL REFORM

The institutional and political dimension of a project is often underestimated, which may render the project impact unsustainable in the long term. Providing support to good governance is always important for NRM. It may include:

1. Training on laws and regulations.
2. Improving contact among stakeholder groups to build trust.
3. Improving writing and numeric skills to enhance accountability.
4. Facilitating networking among groups to defend common interests.
5. Facilitating better local government regulation.
6. Publishing and disseminating lessons learned.
7. Networking among NRM projects for policy reform.

Agricultural extension is a potentially important project component across Natural Resource Management themes. The challenge is sustaining agricultural extension beyond the project lifetime. Community nursery and community forestry in Um Gidabo, North Darfur. © Practical Action

Some practices may be good in theory. However, in the absence of supportive institutions, they tend to be unsustainable. For example, water catchment and land-use planning committees, supported by the Community Watershed Management Project were a good idea, but they proved unsustainable. Institutional reform may be essential. In the West African Sahel, political decentralization has been achieved so that vibrant elected local government ensures local resources management. That has not yet been accomplished in Sudan. Projects may therefore have to adjust their ambitions until governance reform has been achieved (Watershed Management SIP, 2015).

SUPPORT PROVIDED TO SMALLHOLDER GUM ARABIC FARMERS

Introduction

Sudan has traditionally been the world's largest producer and exporter of gum arabic. Most gum is produced by smallholders in rural communities located in the gum belt, which is in the southern part of Sudan (but not the east). Many projects have supported gum producers since the 1980s. Early experience included the United Nations Sudano-Sahelian Office rehabilitation of the gum arabic belt, and establishment of the Forests National Corporation (FNC) Gum Arabic Producer Associations (GAPAs). Project strategies focused initially on the gum arabic resource and later on the commodity chain. Recent projects have focused increasingly on the value chain instead of simply supporting producers (Elamin et. al., 2014).

Export earnings from gum arabic reached $100 million in 2005. However, the sector experienced steep declines in production, and Sudan lost its place as leading producer by 2009. Export earnings declined to $33 million in 2009 because of a number of issues. The most significant was the low producer incentives due to Sudan's domestic pricing policy and monopoly marketing system, through the government-owned Gum Arabic Company. An estimated 18 different taxes and fees were levied on gum arabic at national, state and local levels (Elsiddig et. al., 2007).

Significant reform in the sector took place immediately before project approval as a result of a presidential directive issued in June 2009. The directive abolished all taxes and fees related to gum arabic production and marketing, eliminated the Gum Arabic Company monopoly on trading and export of raw gum, and abolished the floor price policy. This was a major liberalization of the sector.

This section describes primarily a project supported by the World Bank and the International Fund for Agricultural Development (IFAD). Two other relevant projects are also mentioned briefly.

Revitalizing the Sudan Gum Arabic Production and Marketing Project (2009-2015)

Immediately after market liberalization, IFAD and the World Bank financed the Revitalizing the Sudan Gum Arabic Production and Marketing Project ($10 million). The project's objectives anticipated improved opportunity and competition available to market actors, better organized and empowered GAPAs, and reduction of environmental degradation. The project expected better prices for producers and increased participation of women (Revitalizing the Sudan Gum Arabic Production and Marketing Project, 2016).

The primary target group for the project was small-scale producers located in North Kordofan, South Kordofan, White Nile, Sennar and Blue Nile States. However, conflict occurred within some of the targeted areas, so the project ended up mostly supporting Hashab production in North Kordofan (Revitalizing the Sudan Gum Arabic Production and Marketing Project, 2017).

The Forests National Corporation (FNC) provided support with the use of training centres and tree nurseries. Support to gum producers included Hashab seedling production in FNC central

The gum arabic market in El Obeid is the largest market in the world. Much of the Hashab and Talha gum collected in Kordofan and Darfur passes through El Obeid. © FNC

nurseries followed by distribution to GAPAs. In total, 1.9 million seedlings were produced in project nurseries and 16 tons of seeds were distributed. It is not known how many seedlings were planted out, survived and grew. This is a common problem with tree planting projects: while information is available about seedling production, little or no monitoring data are available for planted and growing trees, which are more difficult to track (Mohamed, 2010).

The project provided direct support to gum arabic producers through the provision of capacity-building, infrastructure and inputs. The largest implementing modality was matching grants. Support was through 56 small projects providing water points, pumps, tankers, trailers, tractors, stores and offices. Furthermore, the project supported GAPAs with a credit and saving system to reduce the cost of pre-financing gum collection, which was traditionally high because of the Sheil system. It is hard to track the impact of the measures in terms of lessons learned. It is not clear what has remained of the infrastructure and the GAPA savings and credit system after the project was terminated. In one case, an external mission assessed the impact 2 years later, and found that the credit system and the infrastructure were no longer functional in the visited area (Revitalizing the Sudan Gum Arabic Production and Marketing Project, 2017).

The project has also tried to mainstream women gum producers in project activities. Some reports mention empowered women involved in GAPAs, contributing to gum arabic production. However, one mission found that participation of women was “cosmetic”, in the sense that they had no real decision-making power in the GAPA committee. One project report emphasizes that there are three GAPAs led by women and that they were successful. Involving women in gum production and marketing systems is a promising option. Nevertheless, 3 women-led GAPAs out of the 194 GAPAs supported by the project is a modest achievement. Gender issues remain elusive unless more gender-specific information is available (Revitalizing the Sudan Gum Arabic Production and Marketing Project, 2016).

Women are participating in planting and harvesting the gum arabic in Sheikan, North Kordofan. They may require specific women's organizations for successful participation, rather than mixed groups of men and women. © UNEP

The project was expected to identify constraints of trade and investment in the value chain and analyse market opportunities. It was thought that the project would support policy or institutional reform in gum arabic through studies and policy dialogue. While some studies were undertaken, further policy reform was too difficult. The key reform had already been implemented in 2009. The project was also meant to finance the establishment of a gum arabic Market Information System (MIS) and a dedicated website for the Sudanese gum arabic sector. The Ministry of Trade was expected to take on this responsibility and it received some support. Communicating with GAPAs and traders via text messaging was not achieved (Revitalizing the Sudan Gum Arabic Production and Marketing Project, 2016).

The 2009 market reform was effective. The share of the international gum market price achieved by small producers increased many times: according to some estimates, from 15 per cent to 60 per cent of the free on board (FOB) price. National statistics show that total gum production rebounded to pre-2005 levels and so did export earnings. The combination of significantly increased gum volumes and higher farm gate prices multiplied rural producer gum incomes. This applies to all gum producers, not only to those in the localities that were supported by the project and shows the overwhelming impact of improved policies and institutions. A study on the design of the MIS was commissioned and completed in 2013. The basic architecture of the system was developed and launched online in 2015. As of project closure, however, the MIS was not functional as no price, production or other data was collected or disseminated through the system.

Support in Structuring the Gum Arabic Sector in Sudan (2014-2018)

A new gum arabic project, Support in Structuring the Gum Arabic Sector in Sudan (SSGASS), was started in 2015. The new project had a different orientation to support gum producers. The objective was the same: to contribute to poverty reduction and environmental protection through an improved gum arabic value chain. However, compared to the revitalization project, it provided few physical inputs to tree growing and gum production, but it did much more to support GAPA organization and efficient interaction among GAPAs and other actors in the arabic gum value chain (Adam, 2016).

The project first invested in dialogue through meetings and workshops, and in dissemination of information on the gum arabic (in this case, Hashab) value chain. It worked with producers and 30 GAPAs, and also village traders and intermediaries. It also worked with a small number of exporters, importers and their agents. Some of this was done through local FNC staff and researchers. In all, 68 GAPA leaders and 1,524 farmers were trained in 2015 and 2016 in 30 workshops.

An interprofessional workshop was organized so that actors would understand the role and responsibilities of others. Previously, there was much distrust, and producers felt they were treated unjustly. After meeting up and having dialogue among all actors, they better understood the problems of others.

Gum quality guidelines with gum quality specifications and best practices were formulated. These were based on available international guidelines and adjusted to Sudanese conditions. Training was provided to the different actors in the value chain, with emphasis on gum quality. A draft manual was developed with technical assistance from an international agency in early 2016. It was translated into Arabic and served as the basis for training courses (Adam, 2013; Mohamed, 2014).

Training on the use of improved tools (sinkies) in North Darfur. © Practical Action

Market Information System (MIS)

The revitalization project intended to develop an MIS at the national level through the Ministry of Trade, but this was not achieved. The SSGASS project applied a different approach to developing an MIS, limited to North Kordofan. The project collected information on the local markets: quantity and prices of gum sales at farm gate and at auction markets in the main towns, and information of export prices (Free on Board, or FOB), on a weekly basis during the season. Some information on the market trends was also provided. Information was then regularly compressed in units that were sent as text messages, 40 messages in total up to September 2017, through the Sudani mobile phone service. Recipients were mostly GAPAs, village traders, intermediaries and companies (SSGASS, 2017).

GAPA members found this information useful, as they had little information compared to buyers. Most village traders benefited because the information helped them to decide when to buy and where to sell, and to gain bargaining power with companies and big traders to whom they sell. Companies did not find it useful because they had the information already. Only 2 out of 30 GAPAs had no access to Sudani phone text messages.

MIS will require an exit strategy, depending on when the project is phased out. Contract farming is one possible such strategy, as explained below. But it applies only to the few GAPAs that are engaged in contract farming, whereas many other GAPAs benefit from better market information. The project has developed the following (Mohamed, 2014):

1. The project relies increasingly on FNC staff for project implementation including market data collection. The project started off with two FNC staff in the team, but now it is staffed entirely with FNC personnel. Market information should be collected locally, throughout the state. This should be done through local FNC staff in different localities, with minor incentives provided.
2. The project wants to support MIS in other states in the near future, possibly throughout the gum belt. FNC has extension departments in all states. The Sudani phone company has offices in all states so that locally relevant market information can be collected, compressed and released in every state. Running text messages is not expensive.
3. Other projects and organizations may contribute to maintaining and expanding MIS.

Contract farming

Obtaining pre-finance for gum collection is the largest constraint to production. It is expensive due to the local Sheil credit system. The revolving funds of the kind that were released by the revitalization project are often not sustainable when a project phases out. Therefore, training sessions were organized for GAPA leaders in financial management, with the aim to improve access to microfinance facilities.

Although the principle of supporting revolving funds was considered in the project document, it was later decided that the project should not substitute for banks, especially for sustainability reasons. This is a reasonable decision, given the experience of revolving funds under the revitalization project. SSGASS project staff developed an alternative strategy, by facilitating linkages among GAPAs and banks. However, there is a lack of trust among banks and GAPAs, and bank policy is generally a constraint to gum tapping credit. As a result, there is no effective bank credit in place for gum producers, even if they are supported by the project.

The SSGASS project has developed an alternative to bank credit in the form of contract farming. This is an agreement specifying the obligations of the GAPAs as producers and companies as buyers and partners in business. Legally, farming contracts entail the sellers' GAPAs obligation to supply the gum volumes and qualities as specified in the contract, and the buyers' (or companies) obligation to purchase the goods, provide services and realize payments as agreed

in the contract. The stipulations of the contracts are not determined by the project but by the two parties involved (SSGAS, 2017).

The contracts in the 2016/17 tapping season generally had the following specifications:

1. Obligations of the buyers:
   1.1 Payment of a premium price, equal to 5 to 10 per cent of the current price (usually 10 per cent).
   1.2 Pre-financing of input delivery on credit (effectively the gum tapping credit). This is the key contribution of the contract and the major incentive to producers.
   1.3 Other non-financial services such as the use of jute bags for better hygiene.
2. Obligations of the producers:
   2.1 Delivery of high-quality gum (Hashab), free of impurities and in stipulated quantities.
   2.2 Delivery of dried gum (in jute not plastic bags), which reduces weight by about 7 per cent.

The premium price compensates for the weight loss due to drying, so that it is not really a premium but rather a compensation. However, the provision of credit is a major benefit for producers, as it avoids the high cost of the Sheil system. The traders and companies receive a guaranteed quantity of high-quality gum in return. Eliminating impurities such as groundnuts is essential (Sidig, 2015).

The first season of contract farming was a test involving 15 GAPAs, one company and one trader. It produced a volume of 2,000 kantar (about 900 t). By the end of the season, farmers under contract farming had increased gum tapping by up to double the areas and quantities they used to tap previously when there was no pre-finance. The production exceeded the amount specified in the contracts. Pre-financing therefore changed the economics of smallholder gum production.

Several other companies have expressed interest in contract farming. This is based on the positive outcomes so far and is encouraged by the SSGASS project. Gum companies are currently investigating the possibility of engaging banks in pre-financing in ways such that GAPAs, banks and companies are involved. This may avoid the deadlock in the smallholder-bank credit system. Contract farming is ideally supported by a neutral third party. This has been the project so far, but it could be relayed to others such as FNC and gum research organizations.

Financial resources

The revitalization project used a $10 million budget to fund the expensive inputs that were required such as tractors, trailers, buildings, revolving funds and large-scale nursery production and distribution. The strategy developed by the SSGASS project, with a budget of $1.5 million focused on sensitization and mobilization of farmers to participate in the project. Most of the work was about bringing people together, building their capacity, improving access to information and developing good relationships among producers and companies. The key inputs were:

1. A team of facilitators trained to communicate effectively with communities.
2. A four-wheel-drive vehicle (although having only one vehicle was a constraint, so FNC in North Kordofan made a second vehicle available).
3. Good leadership and innovative and flexible project strategies.

Other issues

The SSGASS project has also supported a range of other activities such as:

1. Adoption of new technologies, especially in the research of harvesting tools.
2. Production of a film, in three parts, with subtitles in different languages. This has not yet been broadcasted, but involved producers, market actors and the international public (the latter is for global promotion of Sudanese gum arabic).
3. Collective marketing (joint marketing by a cluster of several GAPAs). This has not yet been achieved, but it may be feasible in the near future as trust builds between producers and GAPAs and also between GAPAs and companies.
4. Various microprojects on water basins, stores and sinkies (simple improved hand tool manufactured to replace the axe in the tapping operation of Hashab trees).

The SSGASS project has monitored some gender-specific data but has not pursued a gender-sensitive strategy. Only one woman was on the project team (the coordinator) and she insisted on gender training of staff, and on the elaboration of a gender strategy. The experience of the revitalization project and others show that women can be a powerful influence if the specific conditions of women are taken into account.

GAPAs involving only women tend to be more effective and sustainable than those involving only men. The so-called mixed GAPAs tend to be dominated by men who take decisions and who benefit most. Women often have their own gum gardens and they have a tight social organization but may not move as freely as men to distant markets. They may have access to an MIS, but less access to contract farming. Gender-sensitive support to smallholder gum production requires innovation that has not been undertaken so far.

Projects should build on the fact that women are good networkers by encouraging GAPAs led by women, in addition to having male-dominated or so-called mixed GAPAs.

Gum arabic tapping is usually done by using an improved tool ("Sinkies"). Clean sheets and bags are also needed to transport and store the gum. The key incentive for producers is not the premium price (+10 per cent), essentially a compensation for dried gum, but the seasonal credit provided by the company. © FNC

Natural Resource Management Project in East Darfur

The 2009 gum policy reform concerned the entire gum arabic belt, but the two projects mentioned above were mostly located in North Kordofan, and therefore for Hashab (gum produced from Acacia senegal) production systems. They did not cover the Talha (gum produced by Acacia seyal) gum arabic belt further south. Yet Talha gum production in recent years has exceeded Hashab production by about 50 per cent. One project, the East Darfur Natural Forest Management Project, studied the value chain for naturally growing Talha in 2015 covering the southern part of East Darfur (Natural Resource Management Project, 2015).

Talha natural stand forests are considered tribal lands by local people and state property by the government. Talha gum tapping requires permission from tribal leaders (such as an omda[4] or sheikh[5]). Permission is issued by the native administration based on agreements signed between producers and tribal leaders. Normally, the tribal leader allocates well-defined forest plots for gum tapping, each between 5 and 150 feddans in area, based on the capacity of the producer to tap the area. Allocation is done annually, not for the long term, and demarcation is important to avoid conflicts among producers. The exact deals struck between local leaders and producers, and payments made, are not clear (Adam, 2016; Yousif, 2017).

Value chain analysis provided insights and recommendations on how to improve production and livelihood opportunities. They included providing better access to drinking water for gum producers, building capacity, improving MISs, and especially, providing credit to rural gum producers (like for Hashab, but in a different social and environmental context). However, no support has so far been provided to Talha producers.

The native administration is strong in Sudan. They decide the annual allocation of parcels of natural forest to interested gum collectors. Forests are also an essential pastoral resource for local community's livestock producers. © UNEP

4. An omda is a mid-level leader for all tribes, who oversees an omudiya. The rank is an Egyptian import introduced by the British.

5. A sheikh is the lowest level native administrator, a village headman, or the leader of a small group of nomads.

Gums for Adaptation and Mitigation in Sudan Project

A new major project is being prepared by the Food and Agriculture Organization of the United Nations (FAO), FNC and other partners for co-financing by the Green Climate Fund (GCF). As the project is in the preparatory phase, there are no lessons learned as yet. It will operate in Hashab and Talha production areas (Young et. al., 2009; Fadul, 2017).

Key recommendations

1. Facilitate communication for mutual understanding among actors in the gum arabic value chain.
2. Develop distinctive production and marketing strategies for Hashab, Talha and other gums, depending on project target areas.
3. Help develop and disseminate norms of improved gum qualities (grades) and develop capacity among rural actors (producers such as Gum Arabic Producer Associations (GAPAs)) and local agents.
4. Provide broad market information and contract farming options in specific areas where GAPAs and market operators are well established.
5. Develop and apply women-specific GAPA support "packages" adjusted to organizational potential and marketing options.

A local village Talha market in Bahr el Arab Locality, in East Darfur, 2015. The producers use traditional techniques, so the quality of the gum is often poor, with Talha mixed together with impurities. © FNC

LIVESTOCK CORRIDOR MANAGEMENT

Introduction

Livestock constitutes the largest share of Sudan's agricultural exports. The most commonly quoted measure of the importance of an economic sector or industry is the size of its contribution to the National Gross Domestic Product (GDP). Sudan's official national accounts reveal the very significant contribution made by livestock to the country's domestic economy. Before the independence of South Sudan, livestock has in recent years consistently provided more than 60 per cent of the estimated value added to the agricultural sector. Livestock helps to provide local resilience and rural incomes. Numerous projects have supported livestock corridor infrastructure and services, with the aim to improve relations between farmers and pastoralists, and to help improve performance of the livestock sector. Although such projects have been implemented for decades, there has been a lack of dissemination of lessons learned and good practices (Eltohami, 2011).

This section describes two recent projects in the Kordofan States: the SOS Sahel project (Reduction of Resources Based Management Project) and the Western Sudan Resources Management Programme (WSRMP). The SOS Sahel project dates from 2002 and slowly evolved over the next 15 years as a project dedicated to pastoral–farmer relationship building. WSRMP, supported by the International Fund for Agricultural Development (IFAD), is a broad development project where pastoral–farmer relationships were supported for a long time, but more intensively and widely since 2015. Many other projects have been implemented and others are ongoing (Karamalla, 2011; Abdel Majid, 2017).

The three Kordofan states cover 380,000 km^2. Nomads make up 24 per cent and sedentary rural people 63 per cent of the total population. Civil conflict in the Nuba Mountains and secession of South Sudan have led to disruption of traditional pastoral movement. Increasing trends of urban land use and agricultural expansion, both mechanized and traditional rain-fed farming, have increased the hardship for pastoral peoples. Pastoral communities in Kordofan move over 600 km from North Kordofan through to South Kordofan and then on to South Sudan. They spend most of the dry season in South Kordofan, which is the best time to work with them (Sanjak, 2014b).

SOS Sahel Project - Reduction of Resources Based Management Project

The SOS Sahel project started working on livestock corridor demarcation in North Kordofan in 2002, then expanded into South Kordofan in 2005 and continued supporting pastoralists. The overall objective was to support marginalized groups, reduce poverty and achieve sustainable NRM. Although the project has worked on several livestock corridors in Kordofan, the main lessons learned were from a corridor that passes from Albaida in North Kordofan through to Nabag, Habila, Faiyo, Umhitan and Alhamra in South Kordofan. The project was conducted in three stages (SOS Sahel, 2012; SOS Sahel, 2014).

Stage one (2003–2007)

The project started by identifying key corridors, demarcating them and setting up conflict resolution mechanisms. The project team, with support from the United Nations Development Programme (UNDP), identified three corridors and engaged existing community structures. These included pastoral unions, farmer unions, tribal leaders and government departments. The aim was to develop a sense of shared ownership and responsibility for natural resources by involving all groups. This supported mechanisms in negotiating and monitoring multiple uses (SOS Sahel, 2014).

Boundary poles were constructed along corridors after boundaries had been identified. The awareness of farmer and nomad communities was raised on rules for shared natural resources. This included timing of crop harvesting and access of animals to crop residues. In 2005, other actors such as IFAD concentrated on demarcation of the western and the eastern corridors. Learning and sharing of information among SOS Sahel and IFAD projects took place through meetings, exchange visits and NRM coordination meetings at state level.

The SOS Sahel project moved to work in South Kordofan in 2005. It conducted an internal evaluation that demonstrated a reduction in violent conflict, but there were remarkable weaknesses in engagement of women and youth, who were identified as key players but not included in conflict resolution mechanisms. In addition, shortage of water was identified as a key conflict trigger along the demarcated corridor. These were addressed in stage two (Sanjak, 2013).

Stage two (2007-2009)

Research was initially undertaken to understand the complexity of competing livelihoods in the project area. Studies included an analysis of the historical events that have shaped the region and its people, the changing livelihoods of the farming Nuba and pastoral tribes, and of the highly politicized land tenure, which are much more complex than in North Kordofan. The project adopted a cautious approach, taking time to discuss conflict with a wide variety of stakeholders, build trust among partners and develop the right strategy (SOS Sahel, 2014).

This work showed that it was not possible to replicate the conflict reduction approach previously developed in North Kordofan. South Kordofan presented a different and challenging environment. Women and youth were engaged in decision-making (Sanjak, 2014).

Concrete markers for a livestock corridor. © Practical Action

This strategy started off by working with traditional leaders, before approaching women and youth. Only after agreement of traditional leaders was obtained did the project deal directly with women and youth. Women and youth committees were set up to discuss sensitive topics, including their role in conflict reduction. This was scaled up from women and youth along the Fayio-Um Hitan-Abu Safefa-Al Atmore corridor to across the state.

General meetings were conducted with three pastoral communities in the dry season grazing areas in Kadugli, Abu Safifa and Atmore. These revealed the conflict triggers and mitigation mechanisms used by women and youth. Separate meetings were then held with women and youth, and six new committees were formed and trained. Each was represented on a peace committee. This enabled nomadic people to contribute to peace forums (Sanjak, 2013).

It also emerged that improvement of water supplies along the corridors greatly reduced conflict, as water serves the interests of farmers and of nomads. Fayio village was chosen for water supply improvement because it is on a livestock corridor in a farming scheme, with a high risk of conflict over water. An existing hafir (hand dug water depression) was rehabilitated, another was constructed and a water structure with a slow-sand filtration system was built for drinking water. The improved water supply served settled and nomadic people, and their livestock. A community water committee was organized and trained to manage the structures for fair access and maintenance.

However, new water sources may also lead to range and pasture degradation. Dealing with limited resources will remain a challenge as population pressure grows. Farmers and nomadic pastoralists around Fayio village agreed to a hafir of 20,000 m^3 for two reasons: to avoid settlement of nomads with their livestock and to restore the rangelands. They agreed to enforce the traditional rule that pastoralists use the hafir only during the rainy season up to October and then move on. That leaves water for the settled community during the dry season and restores the rangelands. The arrangement has worked so far and has reduced conflict (Sanjak, 2014).

An enormous effort of consultation is required for peaceful and effective corridor establishment and management. © FNC

Stage three (2009-2016)

The third stage was implemented with the engagement of Tufts University, the United Nations Environment Programme (UNEP) and the International Institute for Environment and Development (IIED). International agencies assisted SOS Sahel to learn from regional solutions for the local context. Examples are the adaptation of East Africa pastoral policy training into the Sudan context, and the sand dam construction and management adapted to South Kordofan. It was found that the following steps of various lengths are important in supporting an improved management system for establishing a livestock corridor (SOS Sahel, 2014):

1. Form a team consisting of all stakeholders (farmers and pastoralists, men, women and youth): this takes approximately three to five weeks for a corridor of 100 km, depending on the complexity.
2. Negotiate with villagers and nomadic leaders on the location of the livestock corridor: this takes about one to three days for field visits accompanied by leaders.
3. Discuss and agree on the corridor width: this may take one to two weeks, especially where the corridor passes through farming areas.
4. Demarcate the corridor using concrete boundary markers with community participation: three to five weeks.
5. Paint the benchmarks for visibility: three to five days.
6. Register the global positioning system (GPS) coordinates of the boundary markers to safeguard boundaries. This will help to resolve disputes in the future, especially if the corridor passes through agriculture schemes where there are no trees or other natural marks. Tractors may remove the boundary posts, and it can be difficult for the corridor committee to identify the boundary without concrete posts: two to three days.
7. Produce satellite maps of corridors and pastures to help the relevant government department develop policies and laws and protect these areas from investors who may want to expropriate the land. For example, North Kordofan endorsed a policy that protects the Albaja grazing reserve from farming or other interference. Endorsement is not possible without clear maps.
8. Discuss water, pasture and services needed along the corridor and agree on suitable sites and modalities: one to two weeks.
9. Monitor and manage the corridor: an ongoing process conducted by one or more corridor committees.

Conclusions

The project team traced one pastoral community along their transhumance routes from dry grazing areas in South Kordofan to the wet grazing areas in North Kordofan with the following findings:

1. The demarcated corridor provided better access and peaceful co-existence for communities.
2. Nobody could encroach as the boundary poles were verified constantly. Assessment of the poles found that about 90 per cent of farmers respected the boundaries. The main exceptions were in Habila locality where the corridor passed through the town (squeezed by buildings) and through an agriculture scheme. Tractors had removed boundary markers and the corridor committee reported this to government officials. Furthermore, the El Kharasan wet season grazing area around El Obeid disappeared due to urban expansion.

3. Resting areas need water sources and should be protected from encroachment.
4. Communities prefer soft and flexible solutions to deal with land-use conflict "Jodia"[6]. Committees need follow-up with the farmer and pastoralist associations that have replaced the abolished unions.

Measuring the cost and benefits of corridor demarcation was hard because conflict reduction and peaceful use of community natural resources are difficult to express in financial terms. Conflict between a few people, for example a nomadic camp and a farming village, can quickly flare up into tribal conflict between nomadic and settled tribes, with livelihood risks to many thousands of people. The nomads who use the Albaida-Nabag-Habila-Fayio corridor and the villagers living along this corridor are estimated to be about 100,000 people. They have been free of major conflict to date (Sanjak, 2014).

The evaluation also pointed out the many challenges that were encountered (Abdel Majid, 2017):

1. Lack of land-use policy is a major problem in North and South Kordofan. All rangelands, which are historically grazing areas, are considered fallow and subject to allocation to other users, mainly agriculture schemes or oil exploration. Expropriation by investors of nomadic and traditional farm land creates conflict.
2. The farming Nuba and pastoral Arabs have contradictory points of view – the challenge is how to get them to respect viewpoints of the other. The Nuba tribes are farmers that think South Kordofan is their land and that Arab nomads should “go home”. Furthermore, some settled Nuba don't understand why compromise corridors are needed on their lands. The pastoralists think the plains belong to them and only the mountains and their foothills belong to the Nuba. Some pastoralists have settled in areas belonging to displaced populations, while some displaced people are now returning.

Consultation on constructing or repairing a sand dam are essential for effective corridor management.
© Practical Action

6.Jodia is a mechanism of conflict resolution used all over Sudan to resolve disputes through volunteers who are trusted and have good reputation with their community without the use of state justice institutions like police and court.

3. Insecurity in some areas seriously hindered the project work. Road access was difficult in the rainy season.
4. Traditional rules may not be functional. Pastoralists are settling in wet season grazing areas, although traditional rules require them to stay mobile.

The following conclusions can therefore be drawn from this project:

1. Corridor demarcation is cost-effective if it is designed as a component of a larger development project rather than a small stand-alone project. Sharing staff costs within a larger project is more cost-effective.
2. Inclusive involvement of all stakeholders such as youth, women and traditional leaders is a pre-requisite for successful corridor demarcation. For example, in 2015, women and youth in Abusafifa managed to stop two armed conflicts before they escalated into widespread tribal conflict. Women used songs that discourage conflict and youth reported the case immediately to the respective tribal leaders and the pastoral union; leaders arrived at the site in less than an hour and resolved the problem.
3. Agreements that ensure construction and use of hafirs are fair to pastoralists and to farmers are essential. Umhitan communities refused demarcation of a corridor through their area because they had limited water sources and worried that nomadic pastoralist animals would drink the water within a few days and then move, thus leaving villagers without water. The deal was construction of a bigger hafir to provide enough water for all users and signature of an agreement that pastoralists do not stay longer than a week in this area.

Western Sudan Resources Management Programme (2005-2017)

WSRMP was located in all three Kordofan states. The project loan agreement took effect in December 2005 for an initial period of 8 years ($49 million). The programme was then extended until the end of 2017. It promoted equitable natural resources governance that is economically efficient and environmentally sustainable. One out of five components was aimed at NRM: rangeland management, corridors and water. The overall goal of WSRMP is to improve the equity, efficiency and stability of the economy of Greater Kordofan Region through rationalizing the regulation and use of natural resources, enabling access of rural poor to productive services and to fair terms of trade. The Programme consists of five components: 1) Natural Resource Management; 2) rural financial services and marketing; 3) community development and extension; 4) rural feeder roads; 5) institutional support (WSRMP, 2015; WSRMP, 2017a).

WSRMP supported forms of natural resource co-management from 2005, but that was applied to sedentary farming communities more than mobile communities. Over time, it became evident that it was difficult to effectively manage the demarcated stock routes by staff from the Range and Pasture Department and project extension team, without the stronger involvement of pastoral and sedentary communities. In 2015, interstate stock route management became a top priority for the remaining years. Two stock routes were selected: one in the east and one in the west (WSRMP, 2014; WSRMP, 2016).

Setting up Mobile Extension Technologies (METs) was an important project innovation, in an attempt to break through sector barriers. Each team consisted of seven members representing different technical departments of relevant rural development ministries Members of the three METs communicated through an Mobile Application group on a regular basis to clarify, share and comment on issues.

The approach to stock route demarcation in WSRMP included:

1. Preparing and sharing key concepts and approaches of co-management in workshops, meetings and seminars.
2. Surveying eastern and western stock routes and adjacent NR.
3. Tracking major resource-based conflicts.
4. Building the capacity of MET members and others.
5. Preparing guidelines and manuals.
6. Building the capacity of communities along the stock routes and facilitating meetings.
7. Running awareness-raising campaigns and their follow-up, and supervising METs.

The Range and Pasture Administration conducted a major part of this work, and many guidelines are available in Arabic.

Achievements

The following key outputs have been reported in terms of immediate achievements:

1. In 2015, physical achievements included demarcation or re-demarcation of 4,470 km of stock routes.
2. In 2016, another stretch of 500 km of stock routes was demarcated by the Range and Pasture Administration with WSRMP support.
3. The northern part of the state was not demarcated because camel owners were not following specific routes.
4. The project demarcated and mapped traditional rangelands (Makharif, Nozol and Masaif) along the corridors, though some were not demarcated because they were contested (WSRMP, 2009; Komey, 2017).

Towards the north, livestock corridor demarcation is no longer essential, as there is not much agricultural land use.
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The project supported "co-management stock route sector teams". These concern sections of the stock routes that are accepted and supported by local government. Each stock route was divided into NRM zones, and each zone had a local co-management team representing pastoralists, farmers, agropastoralists, the native administration and the government (agriculture and livestock departments). The state-level METs were responsible for assisting local co-management teams.

The project attempted to organize stock route management through interstate committees, but the results were not good. It was expensive and difficult to bring the relevant people together at the regional level, and the work was led by government too much. A better approach was monthly coordination meetings in combination with periodic briefings of local authorities. This proved effective because the co-management teams knew the local traditions. The teams assisted in planning and played a key role in conflict resolution, respecting civil and customary laws. They were also important for intermediation between communities and government staff (WSRMP, 2017b).

The project identified water sources along the stock routes. These are essential for pastoralism. Hafirs and other water points tend to serve both settled and pastoral communities. The project supported construction or rehabilitation of water sources for pastoralists, including 26 hafirs. This is expected to reduce conflict over resources (WSRMP, 2016; WSRMP, 2017a).

Pastoral hydrology is essential for all projects supporting livestock corridor management. If projects do not invest in pastoral hydrology, they should at least take into account the existing hydrological infrastructure. © Albert Gonzalez Farran, UNAMID

Conflict Resolution Centres (CRCs) are an innovation for conflict management along stock routes. El Rahad CRC is a successful example. It was established in 2010 by WSRMP on a piece of land donated by the local government and was registered as a conflict resolution non-governmental organization. This centre has a Higher Committee as the governing body, composed of 20 members drawn from senior leaders of the native administration and other highly respected people including three women. It has a daily management committee composed of 11 men and one woman. Furthermore, it has a reconciliation (Ajaweed) Committee, composed of six members drawn exclusively from the native administration (WSRMP, 2015).

Traditionally, conflict resolution has been a male issue. Change towards allowing female involvement is slowly taking place. Nevertheless, women may have an influence that is hard to discern by outsiders. On average, the El Rahad CRC dealt with five to seven cases per month, with the highest frequency occurring during the rainy season because the sector is a major makhraf (resting) area in eastern Kordofan. It solved more than 50 per cent of the conflicts amicably, with lasting peace among parties. The CRC also engaged in developmental activities in partnership with several non-governmental organizations. Having a well-equipped building in a strategic location has been helpful. Some other CRCs were less successful (Sanjak, 2014b).

Pastoral field schools were tasked with multiple functions aimed at improving pastoral livelihoods and developing their animal and natural resources. The Al-Adai pastoral field school attracted 25 individuals. The achievements were limited, given that teachers were not paid. Another constraint was that sedentary trainees dominated the class composition.

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Different livestock herds require different project responses: they need to be adjusted to take account of camel, cattle, sheep and donkey rearing. © Albert Gonzalez Farran, UNAMID

For the benefit of settled communities, 52 range reserves were established for seed production and sales, and for hay production. The hay baling technique was introduced for the benefit of animal owners and milk producers near big towns. The project did not apply Food for Work approaches when supporting range management interventions.

Rehabilitation of open rangeland faces difficulties and has achieved little success, given that open rangeland is communal, and pastoralists have full rights to utilize this resource while not contributing to rehabilitation. In general, settled people own land, and mobile herders have only usufruct rights of range resources.

Outcomes

The WSRMP co-management stock routes model was introduced and implemented from 2015, so lessons learned are recent. The absence of project support since its termination will demonstrate which aspects are sustainable. In terms of higher-level achievements, the following results were reported:

1. The stock routes were more successful in some areas than in others. Agreements were usually appreciated and demarcation posts respected, although there was encroachment in some areas. An important outcome was the reduced number of disputes over the routes that were previously subject to conflict. Corridors received good support from the native administration but much less from government departments. Pastoral civil society institutions, other than the native administration, were almost non-existent, which is a weakness for scaling up. Interstate coordination and agreement was difficult.
2. Management of water points and resting areas is essential and can be problematic in the long term. Demarcation and mapping of the the Makharif (autumn sites), Nozol (camping areas) and Masaif (summer sites) were as important as the stock routes, but they received less attention. Most conflicts occurred in the Makharif and Nozol because they are areas of intensive interaction and competition between pastoral and sedentary farming communities.
3. Community range reserves provided significant livelihood improvements according to a project impact study. They also provided future benefits in the sense that land expropriation by outsiders may be prevented by registration of community range reserves. However, it was not always clear that such reserves were also in the interest of pastoralists who may have traditionally used those same rangelands. Pastoral groups in Sudan hardly engaged in registration, although they are becoming increasingly settled. In other Sahel countries, they are starting to register communal rangelands.

Common ground

While there are some different approaches in the SOS Sahel project and WSRMP experiences summarized in this article, the key findings are similar. Differences are mostly the result of local geography, funding and time available. The key conclusions are the same for the two projects and others such as the Butana Integrated Rural Development Project. The added value of the Butana project is the development of community networks to defend local interests. Ongoing and new projects should benefit from the overall experience gained, develop their own innovations and share lessons learned among organizations, which remains a critical weakness in Sudan.

The Range and Pasture Law was adopted in 2015 at the federal level. While the new law is a step forward, laws and regulations on natural resources need to be harmonized. All partners need to engage in this task because sustainability and scaling up rely on appropriate institutions, policies and laws being in place. This includes developing international livestock corridors that are now standard elsewhere in the Sahel. In the long term, land-use plans, and land registration are essential for pastoral resources. However, this is currently a distant objective in Sudan.

Key recommendations

1. Recognize that pastoral resources along livestock corridors are important. Routes, water supplies, resting areas and other services should be conceived as one package for a viable livestock economy.
2. Effectively manage existing corridors and other resources. This requires development

of effective institutions, which should be representative, accountable and efficient, and which should interact with government and native institutions.

3. Apply new and simple technological tools such as global positioning systems, rapid mapping tools and smartphones, and develop the capacity of stakeholders to use them. This will help to clarify resource negotiation and avoid land grabbing.
4. Help pastoralists evolve as an efficient private sector branch by adopting improved norms and veterinary standards, investing in water, developing market information systems, etc. Assist those pastoralists that are marginalized and drop out in adopting alternative livelihoods.
5. Work with marginalized constituencies – youth and women – to build institutions, policies and technological innovation.
6. Work jointly with all pastoral sector projects to help develop government policy and practice, especially on cross-border livestock movement.

DEVELOPING SYNERGY BETWEEN INTEGRATED WATER RESOURCES MANAGEMENT AND NATURAL RESOURCE MANAGEMENT

Introduction

Integrated Water Resources Management (IWRM) may be described as having: 1) multilevel governance institutions, laws, strategies, catchment plans, pricing and revenue generation that manage water resources and 2) catchment-based monitoring. Natural Resource Management (NRM) may be defined as managing natural resources in sustainable, participatory and efficient ways.

IWRM and NRM are therefore similar but are viewed from different perspectives in Sudan. This is because water and other natural resources sectors are separated into different ministries, strategies and policies. This complicates integrated resources management. The issues related to natural resources such as water, soil, and land-use in the fields of agriculture, forestry, and range production are managed by different disciplines, sectors, and stakeholders. Various sector specialists frequently do not work together so that actions by one sector may not be known and appreciated by others (Abdel Majid, 2017).

It has not always been like this in Sudan. The Rural Water Corporation was established around 1960, under the leadership of the first Sudanese Conservator of Forests, Kamil Shogi. This symbolized the integration of water- and land-based sciences at a time when multidisciplinary teams worked together for development. Generally, kit is rare to have multidisciplinary teams in the field of environment in Sudan (Egime, 2014).

IWRM and NRM projects have supported multidisciplinary teamwork in recent years, but the interaction between water and vegetation remains a challenge. This publication therefore describes two recent IWRM projects that relate to water and vegetation/soils through IWRM with a focus on NRM (Abdel Majid, 2017).

Land degradation upstream leads to flooding, riverbank erosion, and siltation of hafirs and low land productivity of the degraded areas. In principle, catchment degradation upstream should be tackled first; in practice, this is hard to achieve. © Albert Gonzalez Farran, UNAMID

Previous IWRM projects include the Wadi[7] Nyala and El Gash basin projects, implemented in the 1980s. Water boards were established, water laws and regulations were adopted, and executive committees managed daily affairs, with the support of these projects. The structure was abolished in 1994 due to national political changes. Lessons learned have been lost. Few IWRM initiatives were attempted over the next 15 years (Eltigani, 2004).

This section describes two projects that provide lessons learned. The Eastern Nile Watershed Management Project was established in 2009. The main component was the Community Watershed Management Project (CWMP), completed in 2014. The first phase of the Wadi El Ku Catchment Management Project (WEK) in North Darfur ended in 2017. The project is now in its second phase (2018-2022). The following other projects active in water and resources management are ongoing:

1. Sustain Darfur Program (Aqua4Darfur) (North, South and West Darfur).
2. Water for three states (Aqua4East) (Kassala, Gadarif and Port Sudan).
3. Dry Land Coordination Project.
4. Dinder National Park Project.
5. National Water Resources Management Project.
6. Darfur Development Project.

Eastern Nile Watershed Management Project (2009-2014)

The Eastern Nile Watershed Management Project was implemented over the period 2009-2014 ($30 million), most of which was for the Sudan Community Watershed Management Component (CWMP, $25 million). The component aimed at stronger local institutions for the

7. A wadi is an ephemeral watercourse, normally dry for most of the year.

integrated and sustainable management of watersheds in the Lower Atbara, Dinder and Bau areas (however, insecurity inhibited project implementation in Bau). It aimed at poverty reduction and environmental sustainability through local investment in the watersheds (Mohamed et. al., 2015; ENWMP, 2016).

A wide range of packages was applied in the agricultural, forestry and range/livestock production sectors:

1. Crop production: compost/organic fertilizer, improved seed, seed banks, horticulture and agroforestry, soil and water conservation and water harvesting, irrigation and farmer field schools.
2. Forestry: nurseries and tree planting, seed collection and reseeding, seed treatment, "social protection", taungya[8], community reserves, farm forestry and others.
3. Livestock production: improved breeds, para-veterinary workers, fire lines (extending 221 km), reseeding, introduction of Guar as dry season fodder, mineral supplements, pastoral hydrology, corridors and resting areas, conflict management mechanisms and pastoralist field schools. One activity was reforestation of animal routes and resting areas (covering 3,987 ha by 2012).
4. Financial tools: grants, revolving funds, savings, loans and contract farming.
5. Capacity- and institution-building: community dialogue and consensus building, community and land-use planning, water or catchment planning.

The project established demonstration farms in communities where selected farmers were provided with all necessary inputs including planting materials, labour for land preparation, water pumps and electric generators, and consumables such as diesel, oil, etc. This significantly increased farm productivity (Mohamed et. al., 2015).

By 2014, the project had rehabilitated about 43,000 ha of land and noted a doubling of agricultural crop yields under improved, intensified management. Furthermore, 18,000 ha of rangeland was rehabilitated (Lager, Bo and Noon Abdelrahman, 2015).

IWRM–NRM: fight against gulley erosion. The fight against gulley erosion is endless if unabated degradation continues upstream in the catchment. © Albert Gonzalez Farran, UNAMID

8. A taungya is a system where crops are grown only during the first years of the forest rotation. It should be classified as a forest.

CWMP did not attract funding for a second phase. Evaluators noted that project achievements might not be sustainable in the absence of continued finance. Assessment of sustainable impact is best measured years after project completion, but this is rarely done[9].

The project was working across sectors and across state boundaries and had complicated multi-donor arrangements. This inhibited initial results and affected project efficiency. However, working across sectors is important for IWRM. The hard part was therefore finding the right balance between complexity and implementation efficiency (ENWMP, 2015).

In terms of water science, the project supported data management and capacity-building through providing information technology support and staff training. The science part was mostly directed at Lake Nasser sedimentation, a geographic scale very different from the two NRM subcatchments. In the East Nile project, there was no direct relationship between water monitoring/science and support to NRM by communities (ENWMP, 2016).

The Sudan CWMP is primarily an NRM project across several sectors without the water planning, consultation and regulation that is normally expected in IWRM. Developing a clear link between water management and NRM is therefore a challenge. The lesson learned is that such water–NRM links cannot be clearly established if the catchment scale is too large (such as the Nile basin). To establish these links requires working at a catchment scale where water specialists and water users meet, as shown in the next example (ENWMP, 2015).

Wadi El Ku Catchment Management Project (Phase 1: 2013-2017)

The WEK 1 project in North Darfur was funded by the European Union (EU) and implemented by UNEP and Practical Action. The first phase lasted from 2013 to 2017 (€6.45 million). The phase objectives concerned food security, IWRM and reduced conflict. The project received a global United Nations prize for "best project" in 2017. Scaling-up is expected in the second phase (Wadi El Ku Catchment Management Project, 2017).

The project was reviewed in April 2017. The review found the project concept highly relevant, because it linked water management, agricultural development/food security and conflict reduction in an environment where these issues are crucial. Food security achievements were significant through the use of water spreading structures. Conflict reduction has not been clearly monitored but is judged likely (Adam et. al., 2017; Kerkhof, 2017).

The project is an IWRM project with a clear link between water science and water planning in a wadi sub-catchment and natural resources development in the same subcatchment. In this project, Natural Resource Management was mostly concerned with agricultural development, along with some forestry and range components. Institution-building and capacity development were supported to achieve sustainability (Wadi El Ku Catchment Management Project, 2017).

One of the results was an estimated 7,200 feddans of flood-irrigated land near El Fasher in 2016 (estimated net positive impact). The estimated socioeconomic benefits and cost-benefit ratios were high. Sustainability of the water spreading dams is good, due to the effectiveness of local dam committees. In 2017, the maintenance cost was low in comparison to the added value. It remains to be seen how well the dams will be maintained through collection of user fees when major repairs are necessary (Kerkhof, 2017).

Socioeconomic redistribution is also good. Before the project, mostly wealthy farmers and town-based investors used the water through pumped agriculture private weirs. After the project, poor farmers directly benefited and thousands of internally displaced persons (IDPs) also benefited from working as farm labourers, sharecropping and free access to fodder (where there was none beforehand). Horticultural market supplies were so high in 2016 that prices were much

9. A rare example of "lessons learned" is the El Ain Natural Forest Management Project, evaluated 13 years after project completion.

lower than recorded previously. This benefited many urban-based consumers in El Fasher and the IDP camps, whereas the high productivity still left farmers well off. For the first time, traders purchased horticultural products in El Fasher for sale in Khartoum.

The institutional dimension of the project is probably the key to its success. Locally, the project invested in strong community and producer organizations. For instance, dam management committees were established and trained, so that sustainability is likely. Local committees informally monitor and analyse wadi surface water hydrology and land use, organize local stakeholders, collect funds from beneficiary land users and allocate those funds. They also have a larger catchment perspective. For example, a financial contribution was made by the local Goz Beina dam committee for the benefit of downstream stakeholders (who face water access constraints). Village action plans and their implementation were supported beyond the water spreading areas (Adam et. al., 2017).

At the state level, the project supported NRM/agricultural extension through the well-established non-governmental organization (NGO) Practical Action so that capacity-building in communities occurred instantly. It also built the capacity of government extension agencies, so that they became more effective over the next few years. Some 315 government staff participated in training, workshops and local and international study events. Sustained effort was also made to build the capacity of women at all levels. This was not always possible: for instance, the project steering committee consisted only of men (Kerkhof, 2017).

Nine extension packages were developed through close interaction of communities, the Agricultural Research Centre, and government and NGO extension staff. Farmer field schools were an effective tool, along with community-based extension workers. Practical Action and government extension agencies coordinated their extension work so that there was more likelihood of sustainability after the project. The achievement is that government extension contacts reported by farmers increased from 0.5 per cent (baseline) to an average of 20 per cent (two years later).

Water resources management institutions are essential in IWRM. A catchment management forum was established and made operational for WEK with participation of government, community representatives, civil society and academia, including women. Participants of the forum were well equipped, trained and poised to achieve objectives. However, most members were town based, and effective participation of rural members was constrained by travel cost. The forum has developed a common vision on water and natural resources for WEK. Endorsement of the forum by government requires a formal, statutory dimension that has not yet been achieved.

In addition to the forum, there are many active local water institutions in the wadi. These include dam management committees and local organizations that monitor seasonal water flow, maintain rain gauges, etc. Local water institutions and the forum together are a powerful combination for institution-building.

A ministerial decree was issued by the State Ministry of Agriculture (SMoA) banning the establishment of unregistered dams and terraces, upon recommendation of the forum. The SMoA Decree has not yet been endorsed by the State Assembly. The effectiveness of the Decree needs to be monitored, but it is a sign of the effectiveness of the forum that lobbied for the measure.

The project has supported the science part of IWRM in several ways. Hydrological monitoring tools and training have been provided to the Ground Water and Wadis Directorate (GWWD) in El Fasher, so that data collection is being improved. Water resources monitoring and rigorous water balance development are scientifically complex. Hydrologists and local water institutions need to work together. If not, hydrological equipment installed in the wadi may be vandalized.

The project supported development of a hydrological model, including future water supply and demand scenarios, for the wadi. Training and workshops were conducted to strengthen capacity, for water specialists and also for many others. However, much remains to be done to achieve rigorous science as the basis for water distribution and management in the wadi. For example, it is unclear exactly how expanded flood irrigation near El Fasher will influence water availability downstream. The need for strong teamwork among hydrologists and experts from other sectors also remains a challenge FED/2014/350-649 Republic of Sudan (Kerkhof, 2017).

The effects of the project also concern conflict mitigation including improved relations, which is an important issue in North Darfur. Improved relationships have been noted among the following groups as a result of the project:

1. IDPs and local communities. These relationships were poor at the start of the project, but the new economic opportunities as a result of the project have improved them.
2. State Government representatives, local community leaders and community members.
3. Pastoralists and farmers. These relationships were poor in Darfur for widely documented reasons. The project has helped improve them through a conflict mitigation conference and livestock corridor demarcation. The assistance provided to pastoral community-based organizations, paraveterinary services and camel production training has also improved goodwill. More will be required, since flood irrigation has essentially benefited settled populations.
4. State government agencies. These relationships have improved through numerous joint actions (workshops, study tours, extension packages, forums, etc.). Training different sector agents together has improved inter-sector communication and team building.

Key recommendations

1. Target a catchment scale where water management meets other natural resource management issues and institutions. Projects with limited funding have to target catchments of limited scale.
2. Identify the appropriate water catchment scale for the project, and also the other natural resources "catchments" if they are targeted by the project. For instance, a pastoral catchment applies different geographic boundaries. Water catchment boundaries are essential to water management, but do not necessarily apply to other natural resources.
3. Bring water science and local water management capacity together. Scientific contribution is essential, but scientists may be removed from local concerns and should be made to provide contributions to local water management.
4. Recognize that water efficiency for irrigation and economic efficiency are increasingly related. They require teamwork among hydrologists, agronomists and socio-economists, etc. This may seem obvious, but it can be hard to achieve.
5. Recognize that water and natural resource tenure and management are closely related. Key recommendations for livestock corridors, land registration and others are also relevant for synergy.

REGISTERING AND MANAGING FORESTS AND RANGELANDS BY COMMUNITIES

Introduction

Forests and rangelands are vital natural resources for settled and nomadic people in Sudan. However, widespread deforestation and land degradation have deteriorated the resources. A considerable amount of fund has been spent on tree-planting campaigns to compensate for degradation, but often with poor results. The key to sustainable forests and rangelands in semi-arid lands is better management of existing resources. This requires negotiated appropriation of those resources by local people including pastoralists. Registration of forests and rangelands by communities is the main strategy to achieve this, together with active management of resources. This strategy has been tested for the past 25 years in Sudan and also throughout the Sahel (NAPA, 2007; Lazim, 2013).

Unless communities take control of communal resources and protect their forests and rangelands, those resources will vanish due to land degradation and land expropriation by outsiders such as town based and international investors. © IFAD

El Ain Natural Forest Management Project

Sudan adopted a new forest policy in 1986, followed by the Forest Act in 1989, which specified that communities and private people are entitled to reserve forests. From 1992 onwards, the El Ain Natural Forest Management Project (NFMP) focused on community forest registration in the buffer zone of the Forests National Corporation (FNC) El Ain Forest Reserve. The results were the gazettement of community forests and sustainable forest management by communities (Sanjak et. al., 2015).

The registration procedure involved many steps, to be taken within and among communities, and at the local, state and federal levels. Some steps at the village level were time-consuming, such as the mapping of boundaries. Other steps required significant awareness-raising, convincing and negotiating among communities with overlapping rights, or the granting of permission by

traditional authorities. Community forest gazettement took about 4 years in total, even with the pressure and the means applied by NFMP staff members, who followed up when delays occurred (Siddig, 2015).

Steps at the federal level took the greatest amount of time in the registration process. One particularly prolonged step involved obtaining the approval of FNC and the Lands Registration Department in Khartoum; both had to be satisfied with the map provided by the state-level surveyor. In some cases, federal officials requested a further land survey. When the project ended in 2001, NFMP had registered 14 community forests in El Ain covering about 10,000 feddans. A further 12 community forests were registered later, with the support of the state FNC (Sanjak, 2014a).

The sustainable impact 13 years after the project terminated was assessed through an impact study in 2014. It demonstrated convincingly that community forests were safe from expropriation by powerful outsiders and that they provided a continuing flow of benefits. However, many forests were under pressure due to local population increases and from livestock pressures exerted by pastoralists. Non-registered forests were grabbed or deforested (Sanjak et. al., 2015).

Butana Integrated Rural Development Project

The Butana region is similar to the El Ain area. Outsiders have appropriated large tracts of land for rain-fed and irrigated farming schemes. The pressure on natural resources has increased dramatically and even more so after the secession of South Sudan, so that dry season grazing lands are no longer accessible as they used to be.

In 2006, the Government of Sudan (GoS) and the International Fund for Agricultural Development (IFAD, 2011) established the Butana Integrated Rural Development Project (BIRDP) (covering Gezira, the River Nile, Khartoum, Gedaref and Kassala States). The overall objective of BIRDP was to improve the livelihoods and resilience to drought of poor rural households. The project consisted of a wide range of components including those related to water, credit institutions, smallholder agriculture and policy support (BIRDP, 2017).

A village in Butana supported by BIRDP, an environment similar to that of the El Ain Natural Forest Management Programme in North Kordofan. Unless community resources are registered and/or managed, they are likely to degrade and disappear. © IFAD

Achieving a good governance framework underpinned BIRDP. BIRDP scaled up the community forest registration experience of the El Ain NFMP. The project also developed some key innovations to make this kind of natural resources governance more successful. Experiences and lessons learned from the project were broad, but the following sections focus on natural resources with emphasis on forests and rangelands.

Community forest and rangeland registration

One key innovation of BIRDP in comparison to the El Ain NFMP was the reservation of community rangelands and private rangelands, in addition to community forest registration. An important step for all project components was the establishment of functional community development committees (CDCs). This was a local organizational structure for community action including establishment of forest and rangeland reserves. At the inception of the project, women members were few, but the share of women members later reached about one third and sometimes more. CDCs were essential for internal community debate on priorities and for the establishment of natural forest or rangeland reserves.

By the end of a project community selection process in 2012, about 120 communities out of 140 selected by BIRDP had identified drinking water needs as their first priority. The targeted communities indicated development of rangelands and forest resources as the third or fourth priority, with some significant differences among the five Butana states. Most communities practiced rain-fed cultivation to grow sorghum. The aim was to produce food grains and animal feedstock in years of good rainfall, and animal feedstock only when rainfall was poor. Most Butana inhabitants expressed the importance of natural resources, whether grazing or forest resources, in particular for poor households. Forests are important for livestock throughout the year, and they also provide wood and other products and services (BIRDP, 2017).

Some communities demonstrated interest in developing and registering their own forests and rangelands to serve their needs, particularly for browsing and grazing. Even if the community resource involves forests, the principal objective tended to be grass and fodder production rather than providing wood for building and fuel. In the case of private reservation, owners were interested in rangeland resources, not forests.

Communities identified a sizeable plot of land as a community rangeland and/or forest reserve in one case. In other cases, individuals identified part of their private land and wished to register it as a privately-owned rangeland reserve. Community reserves (forest or rangeland) required a great deal of discussion, as many stakeholders were involved, within the community, neighbouring communities and transhumant pastoralists. Once all stakeholders had reached agreement, the land could be demarcated, and the intention declared to reserve the land as a community rangeland or forest reserve. Before this phase was completed, all parties at the locality level must have signed a no-conflict form (SSNRMP, 2016; Abdel Majid, 2017).

The registration procedure for community forest reservation is given in the box below. By December 2016, 77 communities had reserved 89,094 feddans as rangeland reserves compared

to 45 communities that registered 63,834 feddans as community forest reserves. It should be noted that the reservation process was fully completed for only 1,779 feddans of community forest reserves by the end of that year (3 per cent of the total) (SSNRMP, 2010; BIRDP, 2017).

Procedure for community forest reservation and registration in Butana, 2014:

1. Community-level meetings were initiated to reach consensus. All local groups should have been involved in the registration process, including pastoralists and other nomadic groups.
2. The extent of the forest area was agreed upon.
3. The locality issued a letter stating that there was no conflict (announcement for 15 days). The state Survey Department drafted the letter.
4. FNC at the state level undertook a field survey and produced a map of the intended reserve. It also verified and validated the certificate.
5. The draft map was sent to the state FNC to confirm that the land was not part of any reserved or proposed forest.
6. The state FNC sent back the draft map to the state Ministry of Agriculture and Forestry.
7. The state Ministry of Agriculture and Forestry sent all documents to the federal FNC and made a recommendation to the Land Registration Committee at the Court Authority.
8. After the approval of the Court Authority, all documents were sent back to FNC for issuance of the forest ownership certificate from the state Court Authority.

BIRDP found that the procedure was tedious and complicated, and costs were high.

The results of initial registration may seem quite good compared to the El Ain project, but final registration scores were less than those achieved in the El Ain NFMP. The difference can be explained by the fact that the El Ain project paid for all registration costs at the state and federal levels, whereas BIRDP contributed only half of the registration cost. Many communities were satisfied with limited registration, while others did not want to support the cost of full registration.

Registered community forest and rangeland in Sudan covers an extremely small area compared to the available forest and rangeland resources in the country, and is also extremely small compared to the land registered by FNC as a FNC forest reserve. The following registrations have been achieved:

1. El Ain NFMP plus subsequent community forest registration by FNC in the state: 26 registered community forests, around 10,000 feddans, all fully registered.
2. BIRDP: 152,928 feddans (including registered community forests and rangelands, but not private rangelands), of which 1,779 feddans was fully registered.

Hardly any data are available for community forests or rangelands registered through other projects in Sudan, but the surface areas are likely to be small.

Private rangelands in Butana, supported by BIRDP, do not involve land registration. The landowner or user allocates vacant or cultivable land under fodder crops, like Guar or natural rangeland plants like Blepharis edulis, by seed broadcasting. The rangeland is not necessarily maintained, given the high rainfall variability and variable need for cropland. Apart from rain-fed mechanized farming, which is practised under leaseholds (20 year leases), smallholder farmers do not register or even think about registration.

Other projects/states: Communities have reserved some natural forests/rangelands, such as a known case of 15 feddans in North Darfur (supported by Practical Action), but most of this is not formal registration as described above. It was found that establishing 15 feddans of community forest through tree planting in North Darfur was very expensive and slow compared to protecting 15 feddans of still existing, even if degraded, forest.

It can be assumed that the total amount of registered community forests in Sudan is not more than 100,000 feddans, with only 12,000 feddans fully registered. This can be compared to approximately 17 million feddans registered as FNC forest reserves and to 67 million feddans estimated as forest and rangeland cover in Sudan (2010 SIFSIA land cover survey). In those terms, the amount of land registered by communities is almost negligible. Similar efforts elsewhere in the Sahel led to registration and management of many more community forests, such as about 2.5 million feddans each in Niger and Mali. This can also be achieved in Sudan if there is a will along decision-makers.

Collective action is needed to push the registration process forward and improve the results of community forest and rangeland reservation and management. The BIRDP experience suggests that there is a major potential to move forward, because natural forest in Butana is the main resource for sustainable livestock feed year-round. Most importantly, registration of community assets and active management prevents expropriation of community land and natural resources by powerful national and foreign investors or individuals. Major land allocation to international investors occurred in the 1990s in the El Ain area, but none of the gazetted community forests were affected.

Community rangeland reserve establishment and development

Communities are most interested in registering and managing land for community-owned rangeland reserves, given the desperate need for animal food, particularly during the dry season. To compensate for registration by communities, community leaders may request concessions from some stakeholders and seek compensation (in the form of land) for those who are badly affected by reservation.

The procedure for community rangeland registration start by a request of CDC, approved by the Popular Committee. After verification and mapping on the ground by the Survey Department in the locality, a free dispute certificate may be obtained. Then, the certificate is referred to the state Minister of Animals Wealth[10], who then refers it to the Range and Pasture Administration for review and validation. There are some differences among states depending on legislation. The implementation of the 2015 Rangelands Act is still unclear to BIRDP staff. This is not surprising because the Government has not yet approved the federal regulations required for application of the new law. Currently, two community rangeland reserves have achieved all steps of community rangeland registration for a total of about 49,000 feddans.

To demarcate reserved land, metal posts were fixed at the corners and along the boundaries with panels explaining to visitors that their animals should not enter. In other cases, soil bunds were used as markers. BIRDP has urged communities to develop their own regulations and use traditional rules as well as existing state and federal laws, or any locality bylaws that may exist. Doing so raises the awareness about reserves among the settled communities and outsiders. Experience has demonstrated that this is not enough. The main issue is not primarily registration of the rangeland reserves, even though that is useful. The key issue is protecting these rangeland reserves during the growing season in view of the great influx of animals from the south.

10. According to the new restructuring of the ministries at most of the states in 2018, the Ministry of Animal Resources was replaced by Ministry of Production and Economic Resources.

Rawashda FNC gazetted forest is subject to very high livestock pressure and absence of natural regeneration, except for Laot (A. nubica). The same forest degradation problems occur as in many El Ain community forests, where communities wish to avoid conflict with marginalized pastoralists. © IFAD

BIRDP has encouraged communities to cultivate areas around reserves as a kind of "socioeconomic fence". Livestock keepers face stiff resistance to trespassing during the growing season, when the risk to rangeland reserves is greatest. It was found in Butana that increasing tree cover inside rangeland reserves gave improved protection. The project also encouraged communities to appoint and support guards, although they tended to protect forest reserves rather than rangeland reserves. Locating reserves at great distance from any settlement was problematic for protection and was a constraint for participation of women in reserve management and utilization. A similar experience was found in Abunaanaa village in El Ain: the best protection was guaranteed when a community forest was embedded in dense agricultural land.

Women meeting in Butana. Privately-owned rangelands are not formally registered because land use may alternate with crop production. However, they may be protected by land-management practices such as the use of Guar plantations. Protection may be difficult if rangelands are far from settlements. © IFAD

Between 10 and 12 t of clean seed of rangeland species was supplied annually over 4 years (2013-2016). Seed collection was funded by the project and conducted by communities, particularly poor ones, who developed their seed collection skills. Cluster bean (Guar) has proved its viability as a fodder crop in rangelands. About 10 t of seed was supplied by the project in 2013. After then, communities produced and supplied BIRDP with Guar seed. Guar is resistant to water stress and is not palatable before maturity so that animals will not touch it during the growing season. It is therefore recommended for use in areas where there is little protection of rangeland resources.

Will pastoralists lose out if settled communities successfully register rangelands and forest? Historically in Butana, certain lands are recognized by the community's Native Administration as communal grazing grounds for settlers and pastoralists. These areas are well selected and have good potential to accommodate both groups of users, including at water points. For example, in Gedaref, such lands include Sufayat Al-Wata (78,000 ha), Jebel Mundara, Al-Faresh Al-Abyad and Al-Faresh Al-Azrag. They will continue to serve pastoralists even in the theoretical case of widely applied rangeland registration. The main threat is large farming schemes that destroy many of the remaining communal rangelands.

FNC and the Range and Pasture General Directorate are two separate ministries, and forest and rangeland legislation is also separated. The 2002 Natural Resources Law has not been implemented. However, most forest managed by rural communities serves primarily for browsing and grazing. In real life, there is little difference between rangeland and forest, even though government institutions and laws have created differences. Projects that aim at forest/rangeland management should work with both FNC and the Range Department (Practical Action, 2011).

Cattle concentration around water sources. Note the lack of natural regeneration. © UNEP

Voluntary forest guards

The idea of voluntary forest guards originated from the El Ain project and was supported by BIRDP in 2011. Project surveys showed that the use of volunteers was mostly effective. It could be improved by providing saddled animals, training and refreshment workshops, strong linkages with FNC, mobilization of the communities they serve and incentives for activities that are tied to the natural resources (such as beekeeping). BIRDP also found that some communities regularly paid salaries, although very few did so. It may be hard to regulate livestock numbers, if only to avoid conflict with pastoralists who are under numerous constraints themselves.

A village in Butana supported by BIRDP, an environment similar to that of the El Ain Natural Forest Management Programme in North Kordofan. Unless community resources are registered and/or managed, they are likely to degrade and disappear. © IFAD

Community networking for natural resource management

An IFAD review mission pointed out that policy reform in Natural Resource Management (NRM) is essential, as many existing policies and institutions have not been improved. The project decided to support governance through natural resources forums that debated constraints, recommended how to move forward and lobbied for change. Since 2015, 24 community-level forums have been implemented, as well as nine locality forums and five state forums.

Community-level forums focused on some basic problems related to forestry such as natural resources and livelihood bases for communities, though most of the forum discussions were about water. The influx of more than 8 million heads of livestock, disrespect for livestock routes, encroachment by large-scale mechanized farms, land disputes among local people and state-linked investors were also among the issues discussed. These are expected to contribute to national debate and policy reform, which is a major task.

Networking was a significant innovation of BIRDP. Safeguarding community natural resources cannot be achieved on a major scale under the existing regulatory framework, as first attempted in the El Ain NFMP. It requires communities and other local organizations to debate and defend their interests, at locality and state levels, right up to national level, so that policies improve. This requires synergy among projects, non-governmental organizations, United Nations agencies and others.

One example of a successful BIRDP intervention was community networking for NRM, in particular the At-Tasab Network for NRM. Some neighbouring communities came together under one body as a legal entity that formed this network initially. Six communities established At-Tasab in 2014. Owing to the effectiveness of the network, membership continuously grew, and by December 2016, the network involved 16 neighbouring communities. The following examples show why this network was effective for its members:

1. Sixteen communities together in one network were more powerful than individual, scattered communities. Working together was important when faced with powerful outside interests. The state Ministry of Agriculture established two veterinary service centres in response to a request from the network. Lobbying by the network to get telecommunication and other services was successful: an antenna was established, and a new mobile phone service had a positive effect on natural resources patrolling.
2. One rangeland reserve was shared by four communities under At-Tasab, estimated at 3,000 feddans, and was surrounded and therefore protected by mountains, water and human settlements. Tree cover inside the shared rangeland reserve increased from 70 to 165 trees per hectare due to network interventions. Average dry fodder production increased from 1.5 to 2.5 tonnes per hectare, and revenues and employment opportunities increased as a result. The network facilitated protection due to economy of scale.

Forums also had an impact at the state level. Gedaref State issued an act to increase the size of community land around villages (a kind of village sanctuary, locally known as Haram Al-Gharya). This was to allow for poor and landless people, specifically households headed by women, to cultivate crops and vegetables as well as to herd their animals.

BIRDP has supported collective action involving networked communities, localities and states to achieve reform or pressure for reform at higher levels. Much more of this work will be required to achieve reform, including networking among NRM projects to facilitate change at the federal level. © IFAD

Key recommendations

1. Community resource registration is registration of public land and resources by communities. It should be promoted to enable local resource management (recognition, rules, sanctions and investment) and prevent land grabbing.
2. While there is a legal distinction between forests and rangelands, tree and rangeland resources coexist on the same land, possibly together with other resources such as water. A wide range of stakeholders should therefore be consulted including settled and nomadic communities.
3. Federal level registration is burdensome, so local registration may be the only option for most communities. This is a good start until an improved land tenure system is in place. Networks of community institutions may be developed to make local registration more robust.
4. Enhanced national policies and institutions are essential. Operating in synergy at the national level will make a difference to achieving this. It requires much more communication, exchange and joint lobbying, culminating in national-level reform involving all partners.
5. A massive area of government reserve and unreserved forest is mostly degraded. It has huge potential for future sustainable resource management by communities but requires a great deal of support for innovation and reform.

A woman cultivates vegetables, Few communities establish these plantations without external assistance. © IFAD

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1. Supporting livestock corridor management.
2. Registering and managing forests and rangelands.
3. Providing support to smallholder gum arabic farmers.
4. Developing synergy between Integrated Water Resources Management (IWRM) and Natural Resource Management (NRM).

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