Mapping land and natural resource rights, use and management

Participatory mapping uses a range of tools including data collection tools, such as mental mapping, ground mapping, participatory sketch mapping, transect mapping and participatory 3-dimensional modelling. Recently participatory mapping initiatives have begun to use more technically advanced geographic information technologies, including Global Positioning Systems (GPS), aerial photos and use of remote-sensing images, Geographic Information Systems (GIS) and other digital computer-based technologies. IFAD supported projects and programmes are increasingly making use of these technologies for mapping land and natural resource rights, use and management.

In Kenya, GIS, remote sensing and mapping have been widely used under the Mount Kenya East Pilot Project (MKEPP) as tools for natural resources management and for monitoring the project's progress. This includes interpretation and analysis of natural resource data, for use in the development of the Resource Management Plans (RMP's). Support has been provided by other institutions and projects such as the Regional Centre for Mapping Resources for Development (RCMRD) and the Centre for Training and Integrated Research in ASAL Development (CETRAD). The use of these tools has helped project implementers and beneficiaries to gain a better understanding of the complex interrelationship between physical, biological, cultural, economic, and demographic considerations around a specific resource and to make more informed decisions in natural resource management.

The Kirehe Watershed Management Project (KWAMP) in **Rwanda** is contributing to the strengthening of institutional and legal framework needed to achieve effective water and land use planning and management practices in Kirehe to enable agricultural intensification that conserves the natural resource base. Areas of intervention are defined by watersheds rather than administrative boundaries. KWAMP is assisting with the formulation of comprehensive Watershed Management Plans (WMP) and the establishment of permanent public/private institutions (CLGS) to manage the development of each watershed, including the implementation of soil and water conservation activities. Community-led mapping exercises are being conducted to identify the extent and present land use in watershed, including an inventory of physical, economic and social attributes. Participatory community mapping techniques are being combined with basic survey approaches using Global Positioning Systems.

In **Madagascar**, IFAD is supporting the on-going reform, restructuring and decentralization of the land administration system in order to increase tenure security. To do so the Project to Support Development in the Menabe and Melaky Regions (AD2M) and the Rural Income Promotion Programme (PPRR) has been using satellite images or orthophotos of the

commenes concerned. They have undertaken land tenure diagnosis and planning, and prepared, with the active involvement of all stakeholders, participatory community land use maps and development plans. The projects have furthermore supported the establishment of decentralized communal and/or inter-communal land administration offices and provided them with the necessary technical support, services and equipment to facilitate the adjudication of land claims, and speed up land registration and the issuance of legal certificates to landholders and occupants.

In an effort to support sustainable rangeland development, the Gash Barka Livestock and Agricultural Development Project (GBLADP) in **Eritrea** facilitated the organisation of communities and the formation of user-groups for the control and management of grazing areas within a community's rangeland. Satellite imagery, equipment and staff training were provided to identify possible locations for livestock watering points and drinking-water supplies. Where water is available for livestock, interested communities may select voluntary livestock exclusion areas (VLEAs) of up to 1 000 ha to be managed by guards employed by grazing-management groups formed by the communities.

Remote sensing and GIS have been crucial in the planning and management of Lower Usuthu Smallholder Irrigation Project (LUSIP) in **Swaziland**. The data gathered are used primarily to inform farmers on how to make the best use of the newly irrigated land. Geographically referenced data of the area are used to produce maps pinpointing the households that need special attention; those with very low incomes or situated on land with especially poor crop yields. They also use the maps to outline current land-ownership patterns and to plot community facilities, such as schools and clinics. The mapping information helps LUSIP staff to give advice to the traditional land authorities when planning future land use. The data helps them designate grazing and rangeland areas, resettle people onto irrigable land, and develop guidelines for water supply, roads and electricity. As the project has progressed, the team have been updating the maps and GIS data to keep track of their activities. They now note the exact locations of households on land receiving irrigated water and which have already benefitted from the project's services, including training and crop advice.

In **Uganda**, GLTN has been piloting the application of a Social Tenure Domain Model (STDM) – a pro-poor land rights recording system to effectively address the land information requirements of informal settlements. STDM, based on free and open source software packages has the capacity to broaden the scope of land administration by providing a land information management framework that would integrate formal, informal and customary land systems including tenure and claims on forests and pasture lands. In the pilot, STDM is using a satellite imagery to produce a base map and to update the existing structures and other spatial elements in the targeted settlement areas. Previously, in Ethiopia, STDM prototype was also tested in the context of rural land administration.

Land and Natural Resources Learning Initiative for East and Southern Africa

IFAD and UN-Habitat, through the Global Land Tool Network (GLTN), have entered into a partnership to implement the 'Land and Natural Resources Learning Initiative for Eastern and Southern Africa (TSLI-ESA)'. The initiative aims to improve knowledge management strategies and approaches towards pro-poor and gender-sensitive land and natural resource tenure rights in selected East and Southern African countries.

TSLI-ESA focuses primarily, but not exclusively, on the following five themes:

i.   Using technically advanced geographic information technologies, such as aerial photography, remote sensing technology and Geographic Information Systems (GIS) for mapping land and natural resource rights, use and management.
ii. Recognising and documenting small-scale farmers' land and water rights in irrigation schemes.
iii. Recognising and documenting group rights, focusing on range and grazing lands, forests and artisanal fishing areas.
iv. Strengthening women's access to land.
v.   Documenting best practices in securing land and natural resource rights through business partnerships between small-scale farmers and investors.