

Kenya case study: Participatory 3-Dimensional Modelling

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Background

The mapping project in Kenya involved three indigenous peoples who are all historically and until recently hunter-gatherers, partially absorbed by dominant pastoralist or agricultural peoples. The three communities include the Ogiek of the Mau Forest and Escarpment, the Sengwer of the Cherangany Hills Indigenous Forests (both Nilotic language speakers) and the Yiaku of the Mukogodo Forest, originally Cushitic language speakers but now mostly assimilated into the Laikipia Maasai culture and economy.

The forest-based hunter-gatherer communities are among the indigenous peoples at the edge of the political and economic system in Kenya. Under British law, all three groups had their ethnic identity removed and their territories divided between other peoples. They were all socially cast in the derogatory categories of 'Dorobo' from the Maasai word *Ilitorobo* ('people without cattle') and *Athi* in Kikuyu. The Ogiek are the most disposed, living in the highly degraded Mau Forest Complex. The Sengwer live in a situation of insecurity in the richly forested but threatened Cherangany Hills of Western Kenya, while the Yiaku are found in one of the best preserved indigenous forest ecosystem in the country, Mukogodo Forest.

Under British colonial law, notably as a result of the Carter Commission in the 1930s, all of these communities were 'deproclaimed', their ethnic identity removed and their lands divided into different districts. The explicit intent was to drive so-called 'primitive' peoples out of existence in the British colony. This assault on the hunter-gatherers has continued into the modern era with only one of the seven hunter-gatherer peoples being recognised by the Republic of Kenya as an ethnic group: this being the Elmolo who have been forced away from their hunting-fishing territory of Lake Turkana.

*Left: Reptiles, mammals and even animal dung can be documented using
Geo-spatial Information Technology, such as Cybertracker*

Mapping

ERMIS Africa conducted a series of participatory mapping exercises with mountain-forest based indigenous peoples in Kenya from 2006 through 2008. Indigenous partner organisations included the Ogiek Development Initiative (ODI), the Dorobo Trust, the Sengwer Indigenous Development Project (SIDP) and the Yaku Peoples Association (YPA); all of these are members of the Indigenous Peoples of Africa Coordinating Committee (IPACC) and the Hunter-Gatherer Forum of East Africa (HUGAFO).



Above: Ogiek elders and the 3D map of the Mau escarpment, Nessuit Kenya

HUGAFO is an alliance of community based indigenous peoples' organisations in forest and mountain forest areas of East Africa. HUGAFO member organisations have partnered with IPACC, ERMIS Africa and other organizations to build capacity among the indigenous community to generate, document and share indigenous knowledge with policy makers and its implementers. ERMIS Africa facilitated participatory mapping of cultural and natural landscapes with the Ogiek, Sengwer and Yaku indigenous peoples from the Mau Forest Complex, Cherangany Hills and Mukogodo Forest respectively.

The participatory mapping conducted with three communities offered an opportunity for different generations to work together to document and codify their traditional ecological knowledge (TEK) both explicit and tacit. The aim was to create a visible manifestation of oral knowledge and a platform for dialogue concerning mobilising TEK for advocacy, asserting territorial rights based on historic usage and management of the resources, strengthening intergenerational solidarity, and exploring how TEK could be connected with formal

education. ERMIS Africa intends that reflection on and valorising of TEK held by indigenous elders and communities can motivate greater dialogue with the State about taking necessary steps to acknowledge and safeguard intangible cultural heritage with the aim of integrating oral and informal transmission with more formalised and scientific education provided by the State.

The cultural and natural landscape mapping exercises revealed that each of the communities has an intricate ecological knowledge, practices and innovations emanating and influenced by the natural landscape and the capacity of the ecosystem. Territorial governance, tangible and intangible culture, endogenous economies and livelihood patterns are a result of generational interaction, dynamism and adaptations to the ecosystem. Human activity has been constrained according to the needs of the ecosystem to restore itself and maintain biodiversity, which in turn sustained hunter-gatherer civilisation.

Their collective ecological knowledge, practices and innovations together have provided the communities with the means of survival and mastery of the biological capacity of their territories. This deep rooted traditional ecological knowledge system however cannot withstand the intrusive forces of modern policies, technologies, cultures and economies which do not respect the capacity of the ecosystem to restore itself. The colonial State's wilful ignorance of how TEK played a key role in resilience of the ecosystem is the underlying current conflict with policy and policy makers.



Ogiek P3DM

The first African experience of Participatory 3 Dimensional Modeling (P3DM) was developed by Ogiek people living in the Mau Forest Complex in 2006. Ogiek activists had been involved in the CTA-sponsored *Mapping for Change* conference in 2005 in Nairobi, and felt that the 3-dimensional technique would be of assistance.

Ogiek activists had already been working with ERMIS Africa on using satellite maps and sketches aimed at identifying the boundaries of Ogiek ancestral territories in order to secure their land rights and cultural heritage. The participatory 3D mapping process was organized by ERMIS Africa with the assistance of CTA. Community elders played a central role in the legend making process that helped in stimulating a rich intergenerational knowledge exchange and in strengthening the indigenous language.

Instead of focusing on advocacy and land rights, the elders of the Ogiek felt that the 3D model would be a platform for intergenerational teaching about the landscape and their intangible cultural heritage. The final model resulted in a map of an earlier, intact, healthy and functioning forest ecosystem - depicting the physical, biological and cultural environment as it was in the 1920s. The documentation of tangible and intangible cultural heritage valorised local knowledge, reinforcing Ogiek cultural identity.

The 3D modelling exercise lasted for 11 days and involved the following activities: delivering an orientation on facilitation techniques and P3DM practice; facilitating the construction of a scaled and geo-referenced 3D model by school children; facilitating the composition of the map legend; depicting mental maps by elders; and extracting the data via digital photography. On-screen digitising, ground-truthing and generation of thematic maps followed during the months of September-December 2006.

The mapping exercise was attended by members of the local communities, facilitators, and a number of national and international trainees. The local community was represented by schoolchildren (30), schoolteachers (6) and approximately 120 Ogiek elders, men and women delegated by the 21 clans.

Students manufactured the blank scaled 3D model in three days. Once the model was completed elders from selected clans worked on it in three shifts each lasting approximately 1.5 days. Each shift accommodated 5-7 clans and every clan was represented by four to five elders. Participants were provided with all necessary tools and codes to work on the model. The latter was composed of two units measuring 2.4 m x 1.2 m each.

The exercise led to the construction of a solid 3 dimensional 1:10,000-scale model of the Eastern Mau Forest Complex covering a total land area of 576 km².

For the Ogiek people, the purpose of the exercise was to transfer knowledge and hopefully wisdom and values from the oldest generation to the youngest. The 3D mapmaking proved to be an excellent process for allowing people of all ages to engage with their landscape and heritage in an inspiring and familial environment.

Below: The Ogiek people move their completed model, which has coded pins and yarn to indicate place names. Tags mark all of the indigenous place names, usually not recorded by State cartographers

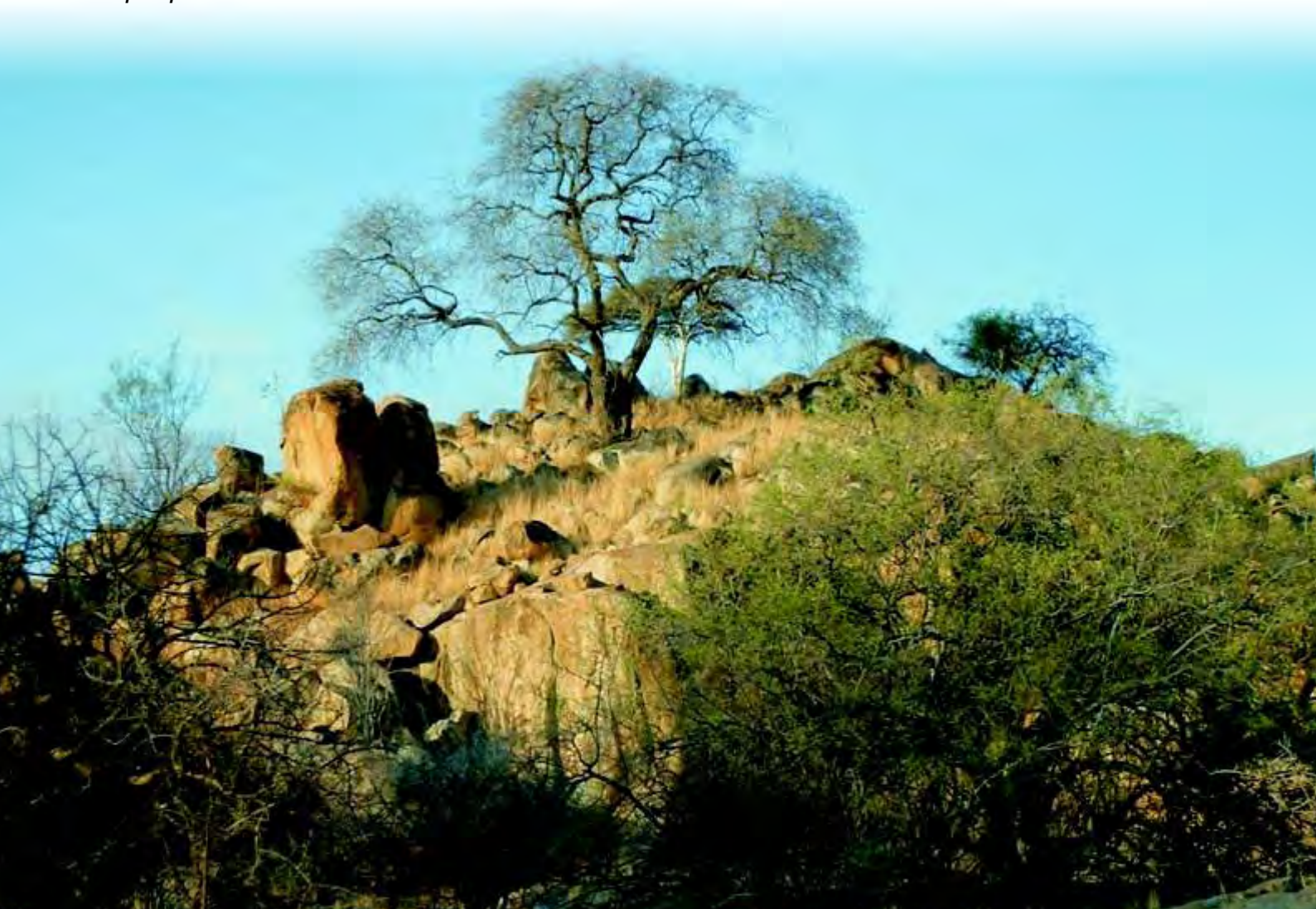


The P3DM proved also to be a catalyst in stimulating memory and in creating visible and tangible representations of a former forest ecosystem. The time spent working on the legend allowed for greater clarity on meanings and the relationship between natural and cultural features. The map captured both the tangible and intangible heritage of the Ogiek people, showing cultural sites, knowledge systems, social relations, community ecological governance as well as identifying physical sites of importance.

The local primary school supported the mapping exercise, despite concerns that the Ministry would not approve of the activity. School learners played a major role in cutting out the map levels in after-school time. Young people worked with elders to code the map and correctly record the intangible heritage. The whole process was characterised by strong intergenerational cooperation, learning and bonding. Different clans worked on the model on different days to provide their local knowledge.

The community did not have an action plan prior to completing the P3DM, a consensus on action emerged through the production of the map. *“After the mapping experience, with the assistance of ERMIS Africa, we developed a Participatory Community Action Plan”* reported Francis Kakwetin, Ogiek representative. The Participatory Community Action Plan addressed several relevant issues, such as leadership, environment, socioeconomic development and education. A community organisation was then created to put the action plan into practice.

“Through the mapping experience we are managing to convince the government to recognize the importance of our Traditional Knowledge System of biodiversity conservation” continues Paul Kanyinke Sena, IPACC Regional representative for East Africa. *“Right now there is a Task Force in Kenya to safeguard Mau forest. Maps helped us to show our knowledge to the government. The government talked to the community elders and realized that a management plan of the Mau complex cannot be made without the knowledge of Ogiek people”*.



Sengwer P3DM

Sengwer (also known as Cherangany or Dorobo) are an indigenous people and ethnic minority originally living as hunter-gatherers along the slopes of Cherangany Hills in Western Kenya. The Cherangany Hills is located in the Rift Valley Province. Due to colonial policies, they today find themselves across four administrative districts: Trans Nzoia East, West Pokot, Pokot Central and Marakwet Districts in and around Cherangany Hills. It is estimated that the current population of the Sengwer is about 30000. Their cultural administrative organisation is made up mainly of sub-tribes, clans and totems.

Cherangany Hills are covered by a series of indigenous forests. These forests are made up of 12 administrative blocks. The soils are well drained and moderately fertile. The hills are important biodiversity hotspots as it harbours several forest types and regionally threatened animal and bird species.

The Cherangany Hills: an internationally significant Water Tower

The Nzoia River originates from Cherangany Hills and drains into Lake Victoria. The Muruny and Empopot Rivers also originating from Cherangany Hills drain their water into Lake Turkana. The watershed of Cherangany Hills forms major conservation areas which include: Saiwa Swamp National Park, known for *sitatunga*, an endangered antelope species; South Turkana National Reserve; Rimoi Game Reserve; and Kerio Valley National Reserves.

Water programmes with international funding all failed to recognise the presence of the Sengwer and their fundamental freedoms, human rights of the indigenous people of the territory. International development agencies including the World Bank, the European Union, KfW Development Bank, and others support the Western Kenya Community Driven Development and Flood Mitigation and Natural Resource Management (WKCDDFM / NRM) initiative. The major water project were initiated without Free Prior and Informed Consent (FPIC) of the Sengwer people. The Kenya Water Supply and Sanitation Improvement Project (WASSIP) in particular has generated new threats to the survival of Sengwer people who do not have secure land tenure, political recognition or representation in governance.

It was after an extensive activism that the World Bank commissioned an Indigenous Peoples Planning Framework for WKCDDFM/NRM and WASSIP. Likewise, KfW Development Bank responded to criticism from IPACC and the Sengwer Indigenous Development Programme (SIDP) by opening a door for negotiation and participation. The Sengwer were able to rely on international instruments to protect the rights of indigenous peoples, as the Kenyan state still does not officially recognise the issue or the peoples involved.

Mapping

After a successful P3DM of Mau Forest Complex by the Ogiek in 2006, the Sengwer community initiated their own Ancestral Land, Cultural Rights and Natural Resource Management project, which included a P3DM in the Cherangany Hills. The project was funded by Rainforest UK and implemented with ERMIS Africa.

Left: The Kenyan landscape





Sengwer Goal

The Sengwer's primary concern was to demonstrate their presence and their historical knowledge, use and conservation of the ecosystem. The mapping would allow the Sengwer to generate an Ancestral Land, Cultural Rights and Natural Resource Management plan. This plan in turn would help the Sengwer negotiate with agencies dealing with decisions over the water catchment, including KfW Development Bank, the Government of Kenya, and other development agencies. The Sengwer were asserting their rights to be recognised, to protect their rights over the use, control and management of natural resources within their aboriginal territory.

Project Objectives

1. Development of a community map by the Sengwer peoples who will be affected by the KfW Development Bank funded 'Kapolet Water Project' for supply of water to Kitale town; and other development programmes in Cherangany Hills;
2. Negotiation, using the map, with the Government of Kenya; KfW Development Bank; the World Bank and other development partners in order to secure a just settlement for the Sengwer peoples;
3. Strengthening Sengwer community's fundamental freedoms, human and indigenous rights;
4. Empower Sengwer people to develop and implement an integrated management plan of their customary domains, natural resources and territory.

The construction of a dam to supply water to Kitale town by the Government of Kenya with funds from KfW Development Bank (Germany) along Kapolet River in Kapolet / Kipteeper forest within Sengwer ancestral territory prompted the community's Elders to decide on the need of carrying out a 3-D mapping of their territory.

Reasons for selecting the project area:

- To have a tangible document for negotiations on Sengwer Ancestral Land and Cultural Rights, and Natural Resource Management;
- Interest by Development Partners (e.g. World Bank, KfW Development Bank, European Union, etc.) to carry out their programmes in Cherangany Hills;
- Its cultural and spiritual value to the community;
- Availability of topographic and terrestrial components.

Negotiation with KfW Development Bank

- Recognition by KfW Development Bank, Kenya Government and Lake Victoria North Water Services Company that Cherangany Hills belongs to Sengwer Indigenous Peoples;
- Recognition and respect that Kapolet is a river with spiritual and cultural attachment to Sengwer Indigenous peoples;
- Acceptance by KfW Development Bank to fund community projects. Already Kshs 20 million has been set aside for construction of a community health centre, a primary school and provision of water to the community.

Security

Government security personnel from the Kenya national army and Provincial Administration have used the model to track armed cattle rustlers' routes in the Cherangany Hills Indigenous Forests.

Sengwer Conclusion

'This is a big achievement in the struggle for our community's ancestral land rights. Thanks to the funding organisation – Rainforest UK for this success. Bless you.'

Sengwer elder Mr Kapkundos.

Sengwer community and trainees benefited from the exercise and realised the potential of Participatory 3-D Modelling / spatial information management and communication as an effective method to address environmental and social concerns as well as to reinforce bottom up development and collective decision-making. Mapping helped get the community recognition which had previously been denied by important development agencies. Mapping literally put the Sengwer back on the map of Kenya.

Left: One of the last five speakers of Yaku shows how to prepare a smoking implement to calm wild bees, Mukogodo Forest, Kenya

Right: Traditional Hadza hunting in Tanzania



Yiaku P3DM

The Yiaku forest hunter-gatherers are found in the Mukogodo Forest in central Kenya. They are survivors of a very old Cushitic language cluster that occupied the territory prior to Nilotic and Bantu immigration. Over the last two decades the Yiakunte language and hunting culture has been displaced and the people are assimilating into Maa-speaking (Nilotic) herding culture.

The sub-humid forest is located in the middle of the semi-arid plains of Laikipia facing the Mt Kenya. Despite their language being listed as moribund with only about 15 speakers and semi-speakers of Yiakunte, the community maintains both a Yiaku and Maasai cultural heritage. The community is progressively shifting their land practices towards Maasai livestock keeping culture combined with traditional Yiaku beekeeping culture.

Landscape

One of the distinctive characteristics of Yiaku culture is honey gathering which is central to their culture both in terms of livelihood and social status. Honey keeping is the primary basis for delineation of family and clan territories. The territorial extent would be determined by the area required to set-up an apiary. This area, in turn, would be determined by honey demand by each family, labour availability to harvest the beehives which was strictly from family members and a general space allowance to avoid very close neighbourhood that would amplify hunting conflicts during hunting activities which demand an expansive territory.

The Yiaku relied on home-made bee log-hive and naturally occurring bee nest either in tree trunks or in rock clefts. The log-hive was made from *Nakapu* tree which was drilled with a cutting tool called *Nkaaba* (Yiaku) or *Lturet* (Maasai). The length of a log-hive would be determined by the length of a human hand approached from the two opposite sides of the hive, hence varying from one individual to another with a diameter enough to fit a human being usually 1½ feet. Oral reports indicate that it can take one person one day to excavate a single log-hive.

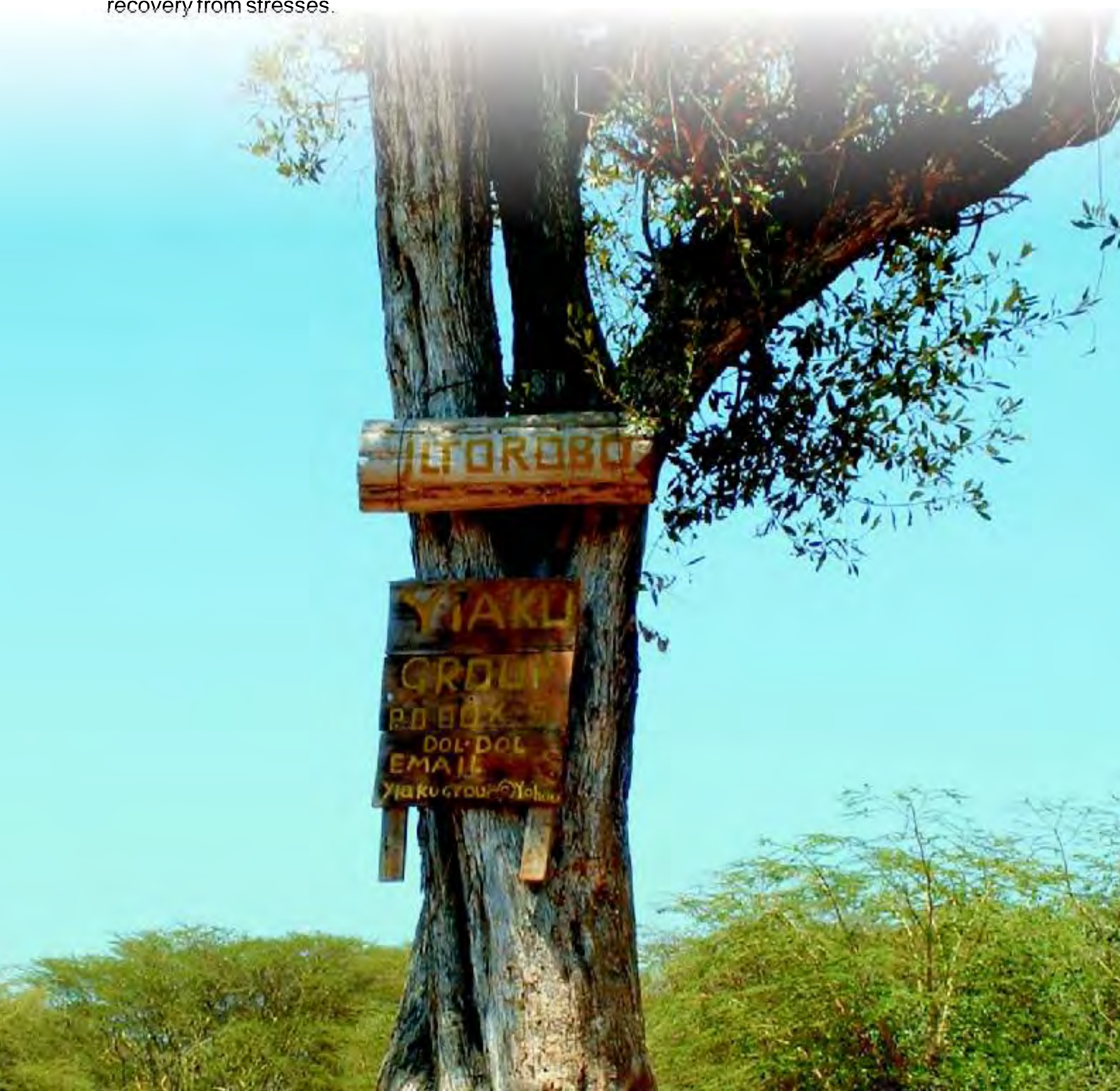
Honey harvesting seasons are determined by the tree flowering season which varies from one tree species to another. The main flowering months are March, August and October which form an annual honey provision cycle thus ensuring food security among the families. In March the dominant tree species is *Lmergweit* (*Croton megalocarpus*), in August the main tree is *Lmorijo* (*Acokanthera schimperi*), while October its *Lgilei* (*Techlea simplicifolia*). The Yiaku maintain strict rules for constraining human activity and cattle grazing to ensure the annual blooming cycle necessary to ensure honey security. This adaptative technique is demonstrative of how traditional ecological knowledge is developed symbiotically with the capacity and functions of the ecosystem where rainfall can be erratic.

Caves are classified in terms of size and geological positioning. *Tilpipi* is the Yiaku name for a cave by a water stream that currently is occupied by hyenas but ancestrally habited by people. In some instances the area has twin caves with an underground cave (*Taapai*) and upper cave (*Tiir-loo*). *Paidong* is a large cave for under ten members and heads of cattle and goats. *Onyimar* is a cave that can accommodate a family of up to 20 to 30 members, made possible by the polygamous practice of the Yiaku community, a herd of goats and sheep, and about 2 honey reservoirs (*iitaamai*) for storing honey especially during drought. *Keeminy tambi* is a large cave with a door at its entrance.



Mapping was an opportunity to bring Yiaku communities together after many years apart, strengthening the coalition between different groups and the intergenerational sharing of knowledge. The Yiaku mapping focused on the cultural heritage of the Mukogodo Forest. Unlike Mau Forest (heavily degraded) and Cherangany (increasingly degraded), the Mukogodo Forest is remote and untouched by loggers. It is also distinguished by not having the presence of State forest officials who are closely associated with alleged illegal logging.

The mapping followed a format similar to that used by the Ogiek, allowing different clans to map their ancestral domains, marking out honey and biodiversity patterns, historic caves, and clan boundaries. The mapping was conducted in Laikipia Maa language as well as the almost extinct Yiakunte language, spoken by less than ten elders. The P3DM was an important opportunity for capturing endangered terminology of the Yiaku language that has only nine fluent speakers. With both Yiakunte and Maa languages, young people came to learn about traditional ecological knowledge, adaptation to climate fluctuations, and the importance of constraining human and livestock behaviour to ensure the integrity of the ecosystem and its recovery from stresses.



UNESCO supported follow-up in Kenya

With the support of UNESCO, representatives of the indigenous peoples' organisations involved in the mapping came together in two workshops to reflect on the mapping experiences and draw forth some observations on the relationship between the mapping and the possibility of safeguarding their traditional ecological knowledge as part of their overall intangible heritage. Knowledge holders and activists shared their experiences of mapping and considered the challenges and opportunities for stimulating further intergenerational and intercultural transmission and valorisation of traditional ecological knowledge, and related values, practices and institutions.

The Education for Sustainable Development project in Kenya consisted of two workshops held in Nakuru in August 2008 and in Nanyuki in November 2008. The first workshop was conducted with indigenous activists and elders, reflecting on the mapping and looking for consensus building about a way to take the project and intercommunity cooperation forward. The results of the Nakuru workshop results were fed into the Windhoek GIT-TEK workshop in August. The second Kenya workshop held in Nanyuki involved a dialogue between indigenous knowledge holders and Kenyan academic institutions tasked with protecting and promoting traditional ecological knowledge through formal education. Participants in the two workshops thus considered both informal and formal means of safe-guarding and transmitting knowledge, culture and values.

The mapping exercises highlighted for elders and youth alike the rich knowledge systems, values, skills and expertise held by forest-based indigenous peoples about their own territories and the links between human activity, human culture and sustaining biodiversity. Each exercise was affirming to community culture, knowledge and traditions, as well as substantially strengthening a sense of shared identity and experience between the mountain-forest indigenous peoples of Kenya. People felt empowered by the mapping and youth and elders felt they had rediscovered a shared language and common purpose.

The intercultural exchanges between community members were positive in all cases. However, ERMIS Africa noted that what was affirming and rich at community level easily turned to anger when government officials were invited to observe and consider the mapping results. Government officials in some cases expressed hostility about efforts of self-definition and cultural self-determination which were perceived as threats to government policies and power. Whereas academics valued the richness of the discussions and results, some further thinking is required as to how to encourage civil servants to see mapping and similar indigenous cultural inventory making as an asset to governance and the State's work of sustainable development planning, adaptation and mitigation, rather than as a challenge to power and authority.



Representatives from Ogiek, Sengwer and Yiaku indigenous communities enumerated the various mapping gains derived from the P3DM and mapping as follows:

Mapping promotes harmony in the community:

Internal Conflicts: Mapping allowed some communities to resolve intra-community boundary conflicts. Among the Ogiek the destruction of the Mau Forest Complex and illegal allocation of parts of the ancestral land to in-migrating communities interfered with the memories of clan boundaries. Confusion about boundaries led to minor disagreements about the existence of and location of landmarks, resulting in boundary disputes among 15 clans. The combination of aerial photo-mapping, P3DM and GPS survey has enabled 14 of these boundary disputes to be resolved by the clans. The three communities confirmed that the territorial land ownership is now explicit among the various constituent clans.

Intergeneration Learning:

The opportunity of the elders, youths and children to interact with the maps and speak at length about the cultural and natural landscape, how it used to be, community governance and values, all enhanced inter-generational and experiential learning.

Discovering Cultural similarities and links:

Similar cultural sites: The three hunter-gatherer communities share some traditional ecological knowledge, such as: specific landscape elements; similar spiritual sites; use of caves; hunting practices; location of salt licks; beekeeping sites; and burial sites;

Shared traditional legal heritage: Land could be exchanged between clans as a fine for a youth impregnating un-circumcised girls or for other anti-social crimes such as a murder;

Language and landscape connection: Sengwer and Ogiek sociolinguistic norms are different. Sengwer speak their language openly, regardless of where they find themselves. Ogiek tend to be more circumspect when surrounded by other ethnicities. Through the mapping and sharing of experiences they discovered a rich shared heritage in terminology, as well as interesting differences.

In all of the mapping the meaning of place names (toponyms) was being lost, and the P3DM was an excellent way to recover, document and reflect on place name meetings. With Ogiek and Sengwer being related languages, they were even able to regain access to place name meetings but studying each other's maps. The Yiaku added to this their experience of documenting their highly endangered language and learning about the knowledge system behind the toponyms, some of which have carried through into the new dominant language;

Traditional and exotic place and biodiversity names: Mappers discovered the importance and presence of aboriginal names as well as recent exotic geographic places names and names of biodiversity (Yiaku, Ogiek);

Shared clan and family names among the three communities: despite living far from each other, they discovered linkages between clans in different communities (Ogiek and Yiaku), and physical resemblances between them (Yiaku and Sengwer);

Shared technologies and skills: Ogiek from Nakuru and from Narok discovered they had the same practice of scenting beehives. All communities paid a great deal of attention to apiculture.

Far Left: Nzoia River, Western Kenya

Left: Participatory three-dimensional modelling requires intense intergenerational communication. Ogiek community members work on the Mau map, Nessuit Kenya



Conclusion

The choice of P3DM for use by Ogiek, Sengwer and Yiaku elders to record their TEK held numerous benefits: promotion of local literacy; modelling of the territory; participation of substantial numbers of people; learning about adaptation; and being able to keep the finished model within the community for future reference and use. The inclusion of a vertical dimension, easy to handle materials (cardboard, cotton yarn, paper and paint) for constructing the model, the visual language, as well as an interactive legend in the mother-tongue, were among the components which enabled the elders to reconstruct their landscape, history and culture. The P3DMs reawakened and affirmed respect for nature and the integrity of the ecosystem.

Main observations and recommendations:

- Mapping is a powerful tool for raising community awareness about TEK and creating platforms for dialogue with policy makers and influence holders;
- Consolidate the partnership between indigenous peoples and technical intermediaries through the development of a clearing house of TEK and PGIS related documentation, as well as training indigenous peoples in information management;
- Promote inter-African dialogue on the value of TEK to sustainable development;
- Improve community awareness of the role of TEK in adaptation and mitigation of climate change, as part of an approach to sustainable development;
 - Promote financial and technical support to help local and indigenous communities access information communication technology and other appropriate resources to provide examples and documentation of TEK valuable for the promotion of sustainable development, food security, peace building, and conservation of biological and cultural diversity;
 - Build alliances between civil society organisations, conservation agencies, academic institutions, rural communities and technology intermediaries to demonstrate, valorise and promote recognition of TEK and community based governance of natural resources and ecosystem integrity;
 - Stimulate United Nations agency engagement in the promotion of participatory mapping and its linkage to ESD and the application of TEK in rural development strategies;
 - Encourage UNESCO to share its normative instruments and approaches with different Ministries in the National government, as well as with other UN / global agencies, notably GEF, UNDP, UNEP, the World Bank and UNFCCC.

*Below: Hanza people in
Yaeda Valley, Tanzania*



Related websites

Reports on Nessuit mapping:

<http://idv.sagepub.com/cgi/content/abstract/23/2-3/113>
<http://www.iapad.org/sfaa/ppt.htm>

HUGAFO website: <http://www.hugafo.org/>

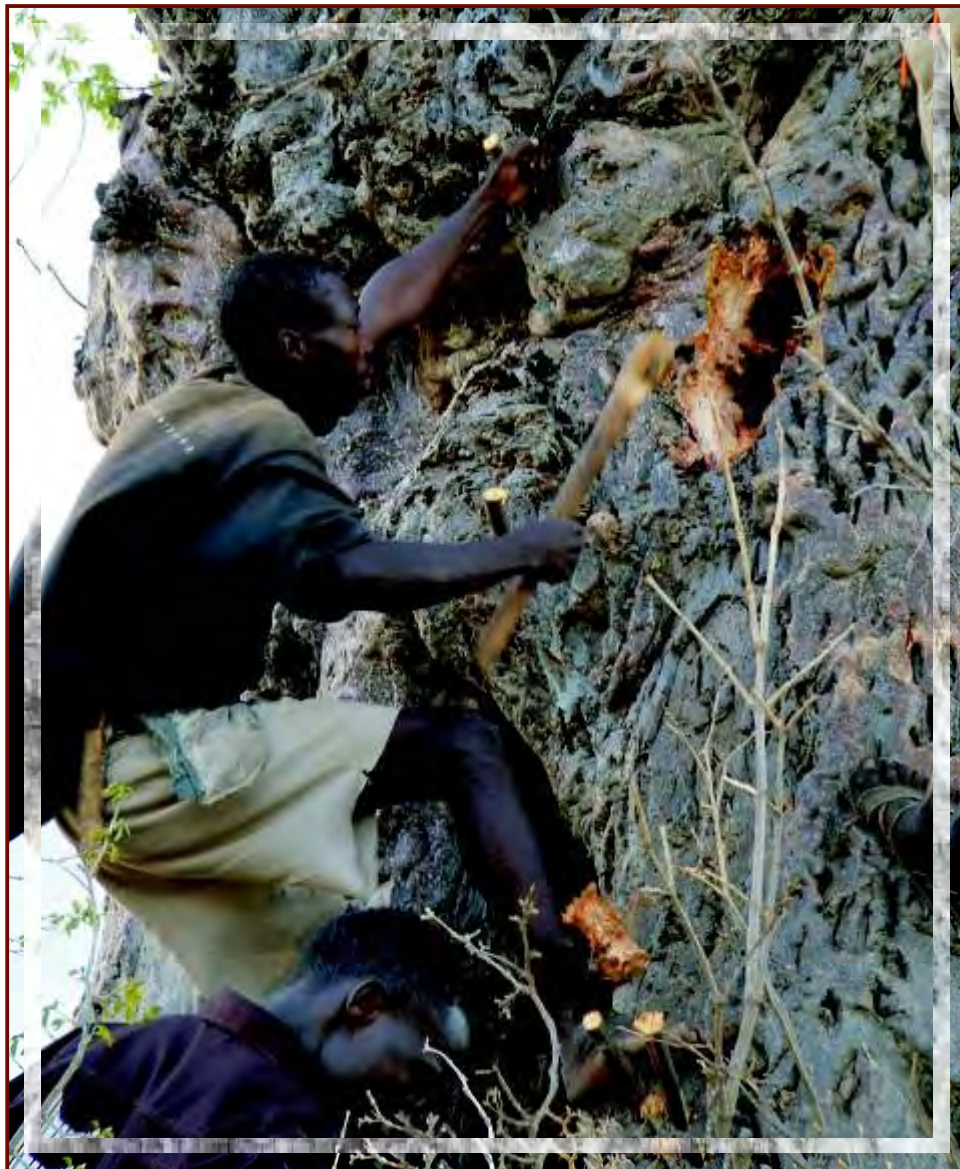
ERMIS website: <http://shalinry.org/reports/>

SHALIN ry website: <http://shalinry.org/reports/>

Ogiek mapping: <http://www.iapad.org/applications/ich/mauforest.htm>

Sengwer mapping: <http://www.iapad.org/applications/ich/sengwer.htm>

Yiaku mapping: <http://www.iapad.org/applications/ich/mukogodo.htm>



Above: Young Hadza boy climbing baobab to collect wild honey, Yaeda Valley, Tanzania