Reviving Indigenous and local knowledge for restoration of degraded ecosystems in Kenya

A contribution to the Piloting of the Multiple Evidence Base Approach
MULTIPLE EVIDENCE BASE APPROACH

This report is part of the outcomes of a collaborative partnership for piloting a Multiple Evidence Base approach\(^1\) to co-generate knowledge and methods for mutual learning across knowledge systems. The project partners are: African Biodiversity Network\(^2\) with Institute for Cultural Ecology (ICE)\(^3\), Kenya and MELCA, Ethiopia\(^4\); Forest Peoples Programme (FPP)\(^5\) with Fundación para la Promoción de Conocimiento Indígena (FPCI); Pgakenyaw Association for Sustainable Development (PASD)\(^6\), Thailand; Tebtebba Foundation, Philippines\(^7\); and SwedBio\(^8\) at Stockholm Resilience Centre, Sweden\(^9\).

The collaborative partnership emerged from an ongoing dialogue across knowledge systems, involving SwedBio and partners among indigenous peoples and local community organisations (e.g. International Indigenous Forum on Biodiversity\(^10\), IIFB) and networks of experts from different knowledge systems. All participants are committed to valuing diversity and are engaged in biodiversity management and its links to policy processes from local to global, such as in the Conventions on Biological Diversity (CBD) and the Intergovernmental Panel for Biodiversity and Ecosystem Services (IPBES). The starting point was the window of opportunity emerging from the possible inclusion of indigenous and local knowledge in IPBES, during the years before IPBES was established. See for example the Guna Yala Dialogue from 2012 at http://swed.bio/multiactor-dialogues/guna-yala-dialogue/, held back to back with the founding plenary of the IPBES. One of the outcomes of the ongoing dialogue has been the envisioning of The Multiple Evidence Base (MEB) approach that sees indigenous, local and scientific knowledge systems as different manifestations of valid and useful knowledge that generate complementary evidence for sustainable use of biodiversity. MEB emphasizes the importance of equitable and transparent processes for mobilizing knowledge and connecting across knowledge systems, and of maintaining the integrity of each knowledge system throughout the process. This means that evaluations of knowledge occur within, rather than across, the contributing knowledge systems when mobilizing and synthesizing knowledge, for example, in an ecosystem assessment process.

One of the objectives of the piloting of MEB has been to develop methods, procedures and good examples for how evidence can be mobilized for multiple needs, at local to global levels, and across knowledge systems. For example, knowledge that is relevant for feeding into local and national policymaking, as well as in processes such as assessments for the CBD and the IPBES, and other fora where working with synergies across knowledge systems are essential. Additional objectives have included: contributing to changing the views that governments hold about indigenous governance and management systems, towards respect and benefit for indigenous peoples and local communities; strengthening livelihoods and well-being within the communities, based on their indigenous governance systems, and finally, promoting joint learning around this across the participating communities and other partners.

The community research that is part of the piloting has been initiated and conducted by the communities themselves, based on their own needs and priorities. Biodiversity, food and culture were the unifying topics. Most of them have earlier experiences of mobilizing knowledge e.g. to recover lost seeds or to protect and revitalize sacred natural sites and rituals connected to them. Past experiences encourage

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communities to continue such work. Some communities are mobilizing knowledge as part of efforts to demonstrate the sustainability of their traditional management and governance systems, as a way of creating an evidence base for policies and decisions at scales beyond the local, that protects rather that counteracts their rights and capacities to manage their ecosystems and resources.

A number of insights have emerged across the five piloting projects. One is the importance and role of mobilizing knowledge before engaging with other knowledge systems. The communities engaged in methods and approaches to mobilizing knowledge that were well suited to the local context and engaged with multiple facets of knowledge, including cultural and spiritual dimensions. How knowledge was mobilized was an important part of building confidence for interactions with other knowledge systems, including authorities. Another insight is the relevance for co-production of knowledge across knowledge systems to connect with interests and needs of all actors involved, including at the local level. For all the communities, mobilisation of knowledge was part of securing territory, authority and rights to govern their ecosystems in a sustainable way. In several communities, the outcomes were well received by local and regional authorities and collaboration has improved.

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Introduction

This report details the processes that two communities went through to bring back the traditional knowledge of their territory.

The work was also undertaken as a pilot to test the applicability of the Multiple Evidence Base approach (see Box 1) in a community process where indigenous knowledge is mobilized. The project was implemented with two communities in Kenya. Firstly, for communities to mobilize and validate their own knowledge, and second, for them to seek opportunities for using this knowledge to secure local heritage and continue using customary sustainable practices in managing their heritage towards endogenous development. An additional aim was to assist the communities to assess the status of resilience of their local social-ecological systems and to develop restoration plans.

Communities drew eco-cultural maps and calendars of the past and present which showed the different statuses in the health of their ecosystems in the two temporal phases. They also took a close look at the customary ecological laws (aspects of customary law that deal with environmental protection) which are used to protect local ecosystems and discussed the status of their use and relevance in the present times. Finally, they drew eco-cultural maps and calendars of the future which showed the desired state of the same ecosystems and the actions to take to realize their vision.

The eco-cultural approach (involving community dialogues and development of eco-cultural maps and calendars) used in the pilot enabled the distilling of indigenous and local knowledge and practices as well as realizing a broad intra-community validation process. Eco-cultural maps and calendars reveal the deep geography, the cultural vision and meaning of the territory, as understood by communities over time. The maps and calendars enable the wider community to develop and hold a collectively agreed vision of the relationships between elements that interact in the territory over time. On the other hand, community dialogues are an important aspect for local governance and consensus building, as most community processes require broad-based agreement for their effective implementation. Dialogues can take different forms and participation – either the whole community may take part or a specific sector. They provide the community with a good opportunity for joint reflection, analysis and consensus-building on priority actions. Such a cultural approach (involving community dialogues, eco-cultural mapping, as well as development of traditional seasonal maps) is important in order to maintain the integrity of indigenous and local knowledge, as envisaged by the MEB process, and avoid further marginalization by science.

Box 1:
The Multiple Evidence Base (MEB) approach

The MEB approach views indigenous, local and scientific knowledge systems as generating different manifestations of valid and useful knowledge which can be jointly analyzed. Indigenous and local knowledge systems can provide valid and greatly needed knowledge to enhance governance of ecosystems, at local levels as well as in global science-policy fora. However, connecting knowledge across scales and epistemologies in ways that are equal, transparent and legitimate remains a challenge, given the ethical and practical requirement to consciously maintain the integrity of each knowledge system involved. Where indigenous and local knowledge and science have interacted in the past, the practice has many times been that science prevails.

However, this practice has been reviewed at the global and national levels, especially with the realization that indigenous and local knowledge and attendant cultural practices can make huge contributions towards addressing global challenges such as climate change, loss of biodiversity, hunger and famine. The Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES), Convention on Biological Diversity (CBD), International Union for Conservation of Nature (IUCN), United Nations Declaration on the Rights of Indigenous People (UNDRIP) and the Global Movement on the Rights of Nature are among the international initiatives working towards recognition of the contribution of indigenous and local knowledge in ameliorating these challenges. At the national level, a number of countries across the world have created significant guidelines, recommendations and also legal frameworks for recognition of indigenous and local knowledge, to the extent of anchoring some of these opportunities in the national constitutions and laws, such as in Kenya. The unfortunate thing is that in some countries, such opportunities are provided in one law and denied in another. Further, current approaches to ecosystems governance continuously fail to consider the processes required to mobilize indigenous and local knowledge across scales and contexts in order to contribute to policy and decision making for enhanced ecosystems governance. For more information, see also: http://swed.bio/focal-areas/themes/biocultural-diversity/a-multiple-evidence-base-approach-for-equity-across-knowledge-systems/

Aim of the MEB pilot project and eco-cultural mapping processes in Kenya

The overall aim of the pilot in Kenya was to support communities in distilling, experimenting, validating and presenting their own knowledge and experiences related to ecosystem governance on their own terms, by zooming in on agro-biodiversity, food and culture. It also aimed at supporting communities to clarify their common position and consciously maintain the integrity of their indigenous knowledge. Finally, the pilot aimed at supporting initial dialogues between knowledge systems – in the case of Tharaka and Masinga supporting dialogues between the communities and governments institutions was particularly important - in jointly identifying and formulating the problems, which is the first phase of a MEB process (Figure 1).

Figure 1. The three phases of Multiple Evidence Base approach, that emphasizes the need for equity and co-production of problem definitions as well as joint analysis and evaluation in processes for generation of knowledge and sustainable solutions across knowledge systems.

Phase 1 Concerns defining problems and goals in a collaborative manner.
Phase 2 entails mobilizing and bringing together knowledge on an equal platform, after valuing and assessing the knowledge within each knowledge system.
Phase 3 is the joint analysis and evaluation of knowledge and insights to generate multi-level synthesis and catalyze processes for implementing found solutions, or generating new knowledge.

To this end, two pilot communities were identified in Tharaka and Masinga where the Institute for Culture and Ecology (ICE-Kenya) is working. The two communities are 121 km apart, and both are in the semi-arid zone. In Tharaka, the focus of the process was on customary ecological law and governance and how this can be used alongside conventional law to enhance the resilience of social-ecological systems. The community prioritized a focus on Kathita River due to its importance as a key water source. The river is now facing serious threats due to destruction of riparian reserve and excessive abstraction of water. The main strategy was eco-cultural mapping. In Masinga, the community prioritized the interactions between agro-biodiversity, food, culture and nature, and how this interaction can contribute to the resilience of their social-ecological system. The process focused on sacred sites/earth spirituality, indigenous seeds and water, with the eco-cultural calendar being the main strategy. It also sought to involve as many stakeholders as possible at different stages of the pilot, in line with Landcare Approach (Tanui, 2006). The figure below represents the stakeholder participation analysis in the two pilot areas.
Figure 2: The various stakeholder and groups participating in the process.

Figure 3 below, summarises the different strategies used in the two pilot areas to mobilize both people and knowledge.

The following sections provide background information on each site, how the process unfolded in each area, and the outcomes so far (up to July 2016). Relevant literature on previous work done in the two areas by government and researchers have also been reviewed and presented alongside the mobilisation of knowledge and experiences of the local people in Tharaka and Masinga.
Eco-cultural mapping from Tharaka

Background Information about the region
Tharaka lies on the low plains between Mt. Kenya on the West and the Upper Tana River in the east. The area is mainly plains and the major ecosystem type is scrub land. The area is generally hot, with unreliable rainfall which quite often leads to crop failure (Economic Geography, Vol.43, No.4., 1977). Drought is a recurring challenge to the livelihoods of the people of Tharaka, from the lowest slopes of the mountain to the banks of the Tana River (Smucker 2007).

Tharaka Constituency extends across 1,513 square kilometres and has a population of about 130,000 persons according to 2009 Kenya National Census. Due to climate change, rains have become erratic in the area. The area experiences a bimodal rainfall pattern with rainfall averaging 500–800 mm per year. Rainfall varies in amounts and effectiveness in the rainy seasons of March, April and May, and October, November and December. Studies by Recha et al (2011) highlight the inter-annual and inter-decadal rainfall variability that characterises Sub-Saharan climatology. Over the years, annual rainfall analyses have reported below average rainfall patterns in Tharaka (Recha, C.S.W, _).

The rainy seasons in Tharaka are unique. Unlike other parts of the country, the short rains are from March to May (Nthano Season) and the long rains in the area are experienced from October to December (Muratho Season). According to the custodians of sacred sites and clan representatives who participated in the process, this season is traditionally the beginning of the Tharaka New Year and whatever happens in the rainy season sets the pattern for the whole year (Verbal discussions with community elders, 2014). Tharaka is generally semi-arid with short trees, and green water amounts are somewhat limited compared to blue water (Geertsma R, LI Wilschut and S Kauffman, 2010). Forests are found on the mountains only.

Harvests for the seasons are done in January and June respectively. Food crops cultivated in the area are millet, sorghum, maize, pigeon peas, green grams and cow peas and they serve as the staples. Domestic fruits prevalent in some parts of Tharaka are mangoes, bananas, oranges; and wild fruits such as tamarinds, sycamores, figs, and many others. However, like many other small-scale farmers, the community of Tharaka is faced with challenges of increasing population pressure, food insecurity, very low levels of agricultural productivity and rapid natural resource degradation associated with nutrient depletion through soil erosion and excessive runoff (Okeyo et al, 2014). A progressive decline in harvests has been reported by farmers and noted in studies by Smucker and Wisner (2008). Cash crops are hardly cultivated but if, they are comprise cotton, sunflower and castor. Aatharaka, the community of Tharaka, keep goats, sheep and cattle too. General temperatures in Tharaka are hot, ranging between 29ºc – 36ºc, though at certain periods they can rise to as high as 40ºc (Recha et al 2011).

However, the territory is currently under huge threat from climate change. Most of the 13 rivers that run through the territory have now become seasonal. Kathita River, the main river on the territory and the water source for many households, is also threatened by excessive abstraction along its course, destruction of the riverine vegetation, destruction of catchment areas, damming and pollution (Snoussi, Maria et al. 2004). The sacred sites along Kathita River have been destroyed, and traditional ecological law is not followed due to the influence of some mainstream religions and systems of education that do not encourage traditional practices based on ILK. The territory is on the verge of losing its social-ecological resilience, with recurrent and persistent cycles of drought and famine. While many development programs have been introduced in the area, the situation seems to be getting worse as the uncertainty of rainfall adds to the number of hydrological risks encountered by the smallholder farmers who have to make key decisions to improve agricultural productivity under uncertain weather related conditions (Ngetich et al 2013). The local people, led by clan-based custodians of sacred natural sites, have come together to find ways of protecting the river using their indigenous knowledge and practices. Improved water management is a salient goal of this process.

13 Traditional ecological law is customary law which deals with protection of ecosystems
Flowing from the slopes of Mt Kenya, with its origins at Rutundu, the Kathita River cuts a meandering trajectory across the length and breadth of Meru and Tharaka-Nithi counties. It empties its waters into the Tana River at Kibuka, with the Tana River flowing onwards into the Indian Ocean.

Besides sustaining life and driving forward the economy of Tharaka, Kathita River is of paramount importance, culturally and spiritually, to the people who live adjacent to its riparian reserve. Throughout the ages, it has informed their way of life as it contains close to fourteen iri - sacred natural sites – where they have communed with their God, Mwenenyaga, and where the spirits of their ancestors rest.

Traditionally, it is in these sacred sites that prayers were offered to ask for blessings, cleansing the land, thanksgiving, and other requests. Kathita River also played a central role in other cultural rites and ceremonies such as circumcision and marriage.

Sadly, the river is drying up! As it winds its way slowly to join Tana River, with its diminishing waters falling down the falls, one can feel its lethargy, a sense of defeat. In some parts along its course, one can clearly see the riverbed as the waters have been reduced to a mere trickle. At its confluence with Tana River, at Kibuka sacred area, it presents a study in contrast in that it shily enters the Tana River, as though embarrassed at the scant waters it gifts the Tana River while Tana’s other tributaries gush in torrents.

Kathita River has been reduced to this sorry state by multiple threats to it. These include pollution, diversion of its upstream waters for irrigation, drying up of its tributaries, deforestation along its banks, sand harvesting, and declining rainfall amounts – all of which continue to strengthen the choking grip of climate change (Olson et al, 2004). Soon, Kathita River may turn into a distant memory with great ramifications to the people of Tharaka, their livestock and crops – indeed to life in the region.

Box 2: Description of Kathita River

Flowing from the slopes of Mt Kenya, with its origins at Rutundu, the Kathita River cuts a meandering trajectory across the length and breadth of Meru and Tharaka-Nithi counties. It empties its waters into the Tana River at Kibuka, with the Tana River flowing onwards into the Indian Ocean.

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The preparatory phase of the eco-cultural mapping process

The success of an eco-cultural process is determined by the amount of preparatory work done with communities in the remembering and validating of their traditional ecological knowledge and practices. Eco-cultural mapping begins with community dialogues which are aimed at mobilizing people to validate and believe in their own knowledge. A series of such dialogues were carried out from January to August 2014, bringing together people from all the sacred sites along Kathita River. Other key stakeholders including local administration, county leaders, government institutions and agencies and local community based organisations (CBOs) working in the region were mobilized. This was an important phase as it prepared different groups from different knowledge systems to start thinking about the river and the challenges it is facing before the mapping event.

Through these dialogues, it also became clear that custodians of sacred sites come from four clans which comprise the community. These four key clans were supported to meet to validate and clarify their ancestral role in ritual practice and protection of sacred sites along Kathita River. They discussed the relationship between the fourteen sacred sites, and their relationship with celestial bodies as well as crops and animals. They discussed the traditional governance issues and the place of clans in ritual practice, and what this meant for enforcement of the traditional ecological laws. The clan-based custodians visited each other in order to validate the knowledge they were bringing back, as they are the embodiment of this knowledge. During their discussions, they identified a total of thirteen sacred sites along the course of Kathita River, from the source to the confluence with Tana River. They then started documenting stories and laws of origin associated with these sacred sites, which were to be discussed during the mapping event, and later used as a base to seek recognition and registration of the Kathita as a sacred river.

A key outcome of the dialogues between the custodians from the four clans was the formation of a Coalition of Custodians. The coalition was formed to ensure the outcomes of the mapping process are generally agreed to by the different stakeholders as they are generated collectively. It clarifies different perspectives and also brings together people from different sectors of the community for a face-to-face discussion of common issues of concern. It clarifies different perspectives and also works in tandem with government institutions and the National Museums of Kenya. The process began with a traditional ritual conducted by the elders (both men and women) at the Ndiairi Sacred Site. The ritual welcomed the rains, good harvest of millet, sorghum, cow peas, and pumpkins and other indigenous crops. The welcoming ritual was followed by a grand dance in praise of Kathita River and the general ecosystem.

The group then had a general discussion on eco-cultural mapping and the calendar development process to ensure all participants were starting on the same footing. They also discussed the aspects to appear on the maps and calendars of the past, present and future, in order to develop consensus. They then divided into three groups to draw the maps of the past, present and the future and the corresponding seasonal calendars.

Every so often, the groups would come back together to check on progress and offer space for validation and to contribute to each of the different maps and calendars.

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14 Eco-cultural process denotes an analysis of interactions between a people’s culture and their immediate environment. In this case, the process reviewed the way the people of Tharaka have interacted with Kathita River over time.

15 A community dialogue is a space in which participants from different sectors of the community come together for a face-to-face discussion of common issues of concern. It clarifies different perspectives and also develops commonly agreed responses to the common issues of concern.

16 There are many government, non-government and community-based organisations working in the area. These were invited on various occasions during the preparations as well as during the mapping event. This was important to ensure the outcomes of the mapping process are generally agreed to by the different stakeholders as they are generated collectively.

17 The four clans are Mbura, Kitherinji, Gankena and Rurii. Each of them conducts rituals at different sacred sites on Kathita river together with other clans to whom they are closely related through complex cultural bonds.

18 The coalition was formed by custodians from the four clans in order to consolidate their voices while working to protect the sacred sites and the river.

19 Rwamba is a cultural institution made of men who act as protectors of sacred sites. They are the last body of humans to intervene on behalf of sacred sites. If their decisions are not implemented, then the case is left to the supra-human realm to intervene.

20 Kibuuru is a cultural institution made of women who act as the first group to intervene when sacred sites are destroyed. They advise on actions to be taken by the person who has destroyed the sacred sites. If this is not done, they take the case to Rwamba.

21 This was a prayer ritual to welcome the visitors to the new area and ask the ancestors to protect them and participate in the discussions by providing clarity on the issues to be discussed during the mapping event. August is also close to the onset of the short rains and the local community conducts their prayers for rains around the same time. At the end of the mapping event, rains came and this was a good sign.
The comments made would be considered by each group. Song and dance 22 in praise of Kathita River and the entire Tharaka territory would punctuate the process, to bring back the memory of certain aspects of traditional ecological knowledge and governance.

22 The community has a lot of songs and dances in praise of Kathita River and Tharaka landscape in general. The songs hold important knowledge and useful information on how the river used to look, how people behaved towards the river – generally the respect that people showed to the river and the territory.

Once all maps and calendars were completed, the participants came together and reviewed each map and calendar at a time. The maps made it easy to understand the different phases and share the feelings about the overall picture presented by the maps. Joint mapping by the local indigenous community and representatives from various government departments was a trust-building process which brought down all communication barriers between the two groups, which would often be visible in other forums where working together would be challenged.
The map of the past presented a beautiful scenario when the river was well protected and had a lush green riparian reserve, bubbling with life in the form of vegetation, animals, birds and even aquatic life. The river water volumes were quite impressive according to the elders who had the opportunity to witness them. During that time, everyone was expected to adhere to traditional ecological laws. The few who did not adhere were fined or severely punished in order to deter destruction of the sacred sites. The map of the present was a reflection of the current status – a diametric opposite of the map of the past – with degraded and lifeless sections of the riparian reserve, diminishing river water volumes and disregard of traditional ecological law. The map of the future represented the common vision embraced by the different knowledge systems of a restored river, bubbling with life and promise again. In their assessment of the hydrological cycle in the Tana River Basin, Nakaegawa et al (2012) had projected that annual mean precipitation would increase significantly (by 15%) in the entire Tana River in the future. Precipitation would increase due to restorative activities on the land which the community also set out as an aim. In this respect, the two “projections” speak to each other.

Together, they analysed the possible causes of the situations presented by the three maps. They were quite surprised by the glaring contrast between the maps and calendars of the past and those of the present. The map of the present times presented the stark reality of destruction that has happened over time, and all participants agreed that the river was faced with a serious threat of disappearing. Using the map of the future, they envisioned a future in which the river would undergo restoration to a scenario analogous to the map of the past. However, the group appreciated the possible tensions, especially with landowners who may view the restorative activities as trespass on their farms. They also identified the possibility of resistance by farmers who are flouting existing abstraction guidelines as well as those who have installed illegal abstraction points.

Using the eco-cultural mapping process, different knowledge systems (local people represented by clan representatives, practitioners represented by different NGOs and other civil society groups, government administration officers, and western science represented by representatives of different government departments – See figure 2) were able to jointly identify and analyze the challenges facing the river. The problem began with land adjudication with sacred sites being allocated to individuals instead of being designated as community land. Under such circumstances, community members would be denied access to such sacred sites for their rituals, which made the sites weak. This also weakened the traditional ecological law, which could not be enforced by the custodians on private property. The land owners then failed to protect the riparian reserves and opened their land to the banks of the river for agriculture and grazing, exposing the banks to severe soil erosion. The Water Resources Management Authority (WARMA) the body in charge of management and protection of rivers, failed to enhance the policy guidelines on abstraction of water from Kathita. Many illegal abstraction points were installed and those which are legal are not following the regulations laid down. The combined impacts of these failures have caused
significant reduction of river water volumes and the imminent drying up of the river. [Similar results were found by Recha et al (2012) during their study on seasonal rainfall variability, onset and cessation in Tharaka.]

After this joint analysis, the participants held a dialogue on the future map and calendar, with regard to the actions they would take in order to reverse the trend of environmental degradation of Kathita River and its riparian areas. They then identified land owners and illegal abstraction points as important problem areas, which they would need to deal with to ensure success of their initiative. Finally, they identified all sectors of government that would be necessary to engage in order to have the actions implemented.

The last day was dedicated to celebration and presentation of the maps to the wider community (representing all the clans) and other local government representatives. The maps and calendars were presented in a big community meeting which was used to adopt the outcomes of the mapping event by the wider community. The government representatives committed to support the local actions. The community then developed a statement calling on all sectors of society, including the government, to support the action plan at their own levels.

Celebration is an integral part of the life of Tharaka people. The process ended in a celebratory mood with local food, song and dance. Mugwe, the spiritual leader of Tharaka people from Kithuri clan, did the closing ritual where he also prayed for just rains and a good harvest. On the evening of this last day of the event, rains came to bless the work done over the past week, which was a sign that God and the ancestors concurred with the week-long deliberations.
Implementation of the action plan

The community has been very active in following up on implementation of the action plan that was developed during the mapping event. They followed up with WARMA to identify illegal abstraction points. WARMA and the community representatives planned to walk up the river and do exactly this. The community also met with their local administrators to discuss strategies for reaching out to land owners who are allowing destruction of riparian reserve. The community is raising tree seedlings and distributing them to those land owners to plant on the riparian reserve.

Working together with the Institute for Culture and Ecology (ICE-Kenya), the community has secured the support of National Museums of Kenya (NMK) to document the sacred sites on Kathita River and petition the government to list the whole river as sacred. The documentation process by NMK happened in May 2014. Similarly, ICE and African Biodiversity Network (ABN) have assisted the community to get the services of a local lawyer to document their traditional ecological laws and supportive legal framework at the national and international level, with the aim of seeking recognition of traditional law as a viable body of law to be implemented alongside conventional law.

An interesting development is that this community has set up a community research group which is spearheading their search for relevant indigenous knowledge and biodiversity, especially of food crops, which they plan to recuperate. They have also started contributing money to buy land on which they will set up a community learning centre where all relevant traditional innovations will be shared as well as for joint work with conventional researchers.

Box 3: Explanation of eco-cultural mapping

Eco-cultural mapping is a participatory process which aims to reveal the deep geography, the cultural vision and meaning of the territory. It develops a collective vision which can help in the reconnection with the past and the understanding of the present and the visioning of the future. The preparation stages before beginning mapping are extremely important for the success of the mapping exercise. The deeper the reflections before the exercise, the clearer the elaboration of the maps and the easier it gets to develop eco-cultural calendars. The maps are critical in helping the wider community to hold a collectively agreed vision of the relations of different elements that interact in the territory over time.

Logical process of eco-cultural mapping:
Map of the ancestral past: it helps to bring back the original knowledge and the ancestral order. It showed the way the ancestors used to live according to customary laws, distilling their culture from interactions with the territory. It provides inspiration when drawing the map of the desired future, as e.g. in this case the group aimed to restore the degraded river ecosystems to a level close to the past situation.

Map of the present: it facilitates the analysis of the impacts, transformations and changes that the territory has suffered over time. It included the modern state and the new structures and foreign ways of governing which have been brought to the territory.

Map of the future: it depicts the desired state of the territory which the community envisions and agrees to move towards. It is accompanied by envisioned actions, processes, restoration initiatives, ways for recreation and resurgence. Its development presented an opportunity to examine strengths, weaknesses and potentials in the light of the maps of the past and of the present. The conclusion of the map of the future consolidates future plans or community ecological governance plans. The map also helps to move forward towards a local, collectively agreed and connected future.
Reflections on eco-cultural mapping process

- Eco-cultural mapping is a potent community-driven people and knowledge mobilisation process, which leads to people believing in the potency of their indigenous and local knowledge.
- When cross-knowledge participation is considered in the planning for eco-cultural mapping, it builds trust across knowledge systems, making joint problem definition and analysis easy.
- Eco-cultural maps manifest the knowledge and understanding of territory, and come as an easy and effective tool for community-based ecosystems assessments. They also assist in articulating a set of rights and responsibilities for communities which are reflected in the actions.

Updates on outcomes from the eco-cultural mapping event up to August 2016
Two years on from the eco-cultural mapping exercise, several of the problems identified by participants in that process have been addressed and in some cases, there has been tangible and visible progress.

- Participants realised the severity of the consequences if action is not taken to restore the landscape and biodiversity. Communities are taking action to reinvigorate traditional practices that support cultural and natural heritage such as contributing to funds to buy land which is managed according to customary and cultural values.
- Participants realised the value of a strong clan system in protecting sacred sites – when the clans come together, they can act to make the land more resilient and create a stronger ecosystem. Some of the Christian faith leaders who were sceptical about mobilising traditional knowledges are now supportive of rituals carried out by elders, for example, ceremonies performed before the rains.
- Increased recognition of two governance systems: the conventional and the traditional. Prior to this process, many disregarded the traditional system despite the fact that the constitution supports traditional governance. Men and women elders are supporting and guiding a number of young members in the community through initiation into activities.

Further inconspicuous but equally valuable outcomes of the whole eco-cultural mapping process include:

- Local communities recognise that they have constitutional rights and are working hard to make sure that together they solve the issues and ensure that their knowledge is included in the processes of building resilience.
- Another outcome of the process of working together as a community and with other groups is a greater understanding of the roles different actors play and better knowledge about who to approach to find out about specific information, for example, to monitor progress.
- The National Museum has started the process of gazetting the sacred sites on Kathita River. One sacred site falls on an area earmarked for construction of a dam. The community hopes that gazettment, if it happens before the dam is constructed, will affect dam construction as it will entail another process of negotiations with different stakeholders.
Kivaa is in Machakos County which forms part of the previous Eastern Province of Kenya. The county stretches from latitudes 00 45' South to 10 31' South and longitudes 360 45' East to 370 45 East. It covers an approximate area of 6,281.4 km² most of which is semi-arid. High and medium potential areas where rain fed agriculture is carried out consists of 1,574 km² or 26 per cent of the total area. The district has a variety of topographical features. The landscape is largely a plateau that rises from 700 m to 1700 m above sea level and is interrupted by an escarpment and a series of hill masses, the highest of which is Klimambogo or Ol Donyo Sabuk, which rises to 2,144m above sea level. Rising steeply to the north east of Athi River is the Yatta Plateau, which is broken by occasional hills. This plateau extends into the basin of River Tana. In the central part of the district is a striking series of hill masses that stretch in a roughly north-south axis. This series includes the Ol Donyo Sabuk, Kanzaalu ranges, Kangundo, Mua, Mitaboni, Iveti and Kiima Kimwe. Most of these hills in Machakos are either sacred or have sacred sites.

Masinga is generally hot and dry, with two rainy seasons, the long and the short rain seasons. The long rains season starts at the end of March and continues up to May, while the short rains season starts at the end of October and lasts till December. The annual average rainfall ranges between 600 mm to 2000 mm. Mean monthly temperatures vary between 21ºc and 31ºc (Mutua et al, 2005). The coldest month is July while October and March are the hottest. However, the onset, cessation and duration of rains have been changing due to influences of global warming (Wambua et al, 2014) and the failure to respect the traditional ecological laws which protect life-sustaining social-ecological systems (Traditional Earth Spiritualists in 2014). 63% of the population is regarded as poor, with the perennial lack of water being the major contributing factor to the poverty. Being largely a semi-arid region, the amount and frequency of rainfall in Machakos is quite erratic. The massive nature of the ground parent rock limits the potential of ground water.

Traditionally, the Kamba community was very religious. Most of the hills and some sections of rivers were sacred. Some hills had a number of sacred sites and this phenomenon is now being used by some stewards to develop an emerging philosophy of ecosystems function of sacred sites, in order to protect threatened hills. Unfortunately, the sacred ecosystems are now under threat of destruction through encroachment and religious intolerance.

ICE-Kenya has been working with the community of Masinga in an area near Kamburu Dam, an area originally referred to as the “Tsetse land” due to presence of tsetse flies (Odingo 1979), to protect sacred natural sites. Agricultural and grazing activities in the area occupy about 86% of the total catchment area (Mutua, 2005). During the course of this work, it became apparent that potentiation of sacred natural sites would require indigenous seeds, which are used in ritual practice at the sacred sites.

Unfortunately, food production in the project site has been greatly affected by climate change and the over-emphasis on industrial farming practices. For a long time, indigenous seeds in the region were not promoted. Successive governments promoted the ‘green revolution’ farming system, which emphasized using chemical fertilizers (Wambua et al 2014) and hybrid seeds. Katumani hybrid maize was promoted as the main staple food, with indigenous crops marginalized to the extent of being referred to as orphaned crops. Most of the soils are also heavily depleted or acidic. Due to this, most households can afford only one meal a day, with devastating impacts on their health status. Due to neglect of traditional laws for protecting springs and rivers, most springs dried up, leaving the community extremely vulnerable to hunger and malnutrition (Traditional Earth Spiritualists 2014). The area has also experienced notable droughts such as La Niña of 1999 to 2000 and 2008 to 2009 which have led to severe water scarcity (Wambua et al 2014). Under such circumstances, the resilience of this farming community is hugely threatened. However, in 2002, the government introduced the Strategy for Revitalizing Agriculture (SRA), which emphasized the use of drought tolerant crops in arid and semi-arid lands (ASALS), most of which are basically indigenous crops.

In 2013, ICE started working with the community to strengthen the whole social-ecological system by revitalizing the sacred relationship between people and nature – potentiating and protecting the system of sacred sites in the area by sustaining the ritual cycle, bringing back indigenous seeds and cultural practices associated with them, reviving the dried up springs, mobilizing and educating people, and collaborating with other knowledge systems. This work is usually led by elders who understand the whole culture around traditional seeds. Men elders lead ritual practice with
the support of women. Women elders lead on the revival of the traditional seed system since they understand indigenous seeds and their various benefits as well as traditional storage practices for effective protection from pests. The following strategies were used to identify, gather and distribute the seeds to farmers.

**Community dialogues**

Community dialogues are an important aspect for local governance and consensus building, as most community processes require broad-based agreement for their effective implementation. Dialogues can take different forms and participation – either whole community or a specific sector of the community. They provide the community with a good opportunity for joint reflection, analysis and consensus building on priority actions. In the case of Kivaa, dialogues were first held with farmers and custodians of sacred natural sites separately. This was important as the farmers are a mixed faith group, with some leading an interesting syncretic life while the custodians are basically indigenous. Dialogues were therefore important to negotiate consensus between all these groups to ensure they respect each other, especially when it comes to ritual practice. Fortunately, they did not all have a problem with this as they come from the same community and have testimony of incidences where indigenous knowledge has worked for them collectively. Instructively, some of them would secretly remind custodians to do rituals when they were due. It was through community dialogues that all the other strategies described below were identified.

**Seasonal calendars and ritual cycle**

The world’s original cultures relate to the reality of time and space in a natural way. Over time, they learnt how to read the cycles and protect nature by evolving appropriate ways of satisfying their human needs while enhancing the source of life. Since ancestral times, the sky and the movement of the celestial bodies have inspired humans to understand the dynamics in nature. This way, they evolved ways of understanding life so that they could weave relationships with time in a cyclical way, and recognise how territory encompasses sacred places and elements. It is therefore very important in processes of cultural resurgence, for the calendars to capture this holistic worldview which sees the relationship between all elements. Cyclical time marks social practices, rituals and celebrations, leadership roles and the dynamic relationship between territory and culture. In this case, any eco-cultural calendar (past, present and future), encompasses the “whole universe”. This translates as follows:
MULTIPLE EVIDENCE BASE APPROACH

- Outer circle shows what is happening in the cosmos, with the celestial bodies (stars and the moon etc);
- Next layer is what is happening in the ecosystem;
- The following layer of the circle shows what is going on with the domesticated crops and livestock in each season;
- The next layer is the human rituals and ceremonies.

There may be more layers the community wants to include, but the emphasis is to try to include the whole territory – including the cosmos and the humans.

Development of calendars is a continuous process which stimulates community analysis and research. However, any processes leading to the development of an eco-cultural calendar should ensure that just as in development of eco-cultural maps, there is a strong and inclusive process with communities where they collectively elaborate the calendars so that a deep understanding of the dynamics of the territory (past and present, with the vision of the future) is achieved before calendars are done. From the whole “universe”, it is possible to zoom in to specific aspects such as doing a calendar for indigenous crops. This would facilitate more detailed research, analysis and planning by the community themselves.

Drawing the eco-cultural calendar in Kivaa

The first step was to hold discussions about the status of food security in their territory. They generally agreed that traditionally they used to feed themselves to a large extent, since the climate was better than it is today. They were also using their traditional crops and other wild edible varieties of roots, vegetables, fruits and berries. However, they now faced constant challenge of feeding themselves, and were always on the government’s food and seed relief programme. This dependency on relief provisions was making them dependent on the government and losing their sovereignty as they lacked control over the food and the seeds.

They identified nine different indigenous crops each with several varieties which were important for their food sufficiency in the traditional context:

- Finger millet, Sorghum, Peas, Cowpeas, Dolichols, Yams, Sweet potatoes, Millet, Pumpkins, Mongu

Some varieties of these crops had disappeared from the area completely, while those which were available were held by a few elders, and in small proportions.

They then discussed the varieties and growing seasons for each, as well as the cultural practices associated with farming and the gender roles across the seasons. The community performed a ritual at each stage of farming – before planting,
to pray for rains and bless the seeds; to protect crops from pests and diseases; before harvesting, to cool the new crops. This ritual cycle needed to be revived in order to assure the right context for growth of crops and a good harvest.

The final section of the discussions centred on storage of the harvests. In recent times, the area has been affected by pests which attack grains in storage facilities. The community has had to use expensive chemicals to protect the little grain they could store. Pests attacking grain and the occasional contamination from aflatoxins were a great challenge to food security, especially when they grew maize. They reflected on their traditional seed saving strategies and identified the central role of Kiinga, which was the main traditional grain storage facility. Only a handful of elders still had the skills to make the facility. These elders were requested to share this skill with the other community members.

Community research group
Once the community had fully agreed that they were losing the seeds which supported their food sufficiency, they decided to constitute a small group to lead the process of bringing back the seeds that had disappeared or were in small quantities. They also considered the context of growth of the indigenous crops, and therefore expanded the mandate of the research group to include the spiritual aspects of seeds, soil and water management, food and seed storage, seed multiplication and value addition. In the last two seasons, six different species of crops were brought back and are being multiplied. The group has also identified five springs that dried up when people failed to follow the traditional law of water protection. Negotiations with people on whose land the springs are found are ongoing, to prepare the ground for cleansing rituals which are expected to spring them back to life. In gender terms, this group had more women since they are the ones who shoulder the burden of feeding their families. If their land is not producing enough, this translates into more suffering for women, as the division of household duties is still slightly skewed against women.

Training on holistic dryland farming skills
Being an arid and semi-arid region, soil fertility and water retention are twin constraints to food production that the farmers have been contending with for a long time. This scenario was compounded by the fact that farmers had been using chemical fertilizers almost entirely on their farms (Wambua et al 2014). The research group described above was mandated to also identify ways of supporting the farmers to enrich their soils and improve its water retention capacity as well (Ongwenyi et al 1993). They came across a civil society organisation which was promoting dryland farming techniques. They recommended the training for their farmers, which was carried out in late 2014. This was the first instance the community sought to collaborate with a different knowledge system in this work.

The training included the following topics:
- Context of farming in dry lands
- Seed enhancement
- Improved soil fertility
- Enhanced crop production technologies for semi-arid lands
- Improving community seed systems
- Enhancing growth of traditional food crops
- Improving post-harvest management
- Technologies to improve pasture production
Cross-knowledge dialogue
Since the introduction of structural adjustment programme (SAPs) in Kenya in the 1980s, extension services have become largely demand-driven. People go to consult government extension officers from their offices. This means local people with knowledge that can be used to resolve specific community problems become important in their own localities. In the absence of government extension services, Kivaa community decided to make good use of available indigenous knowledge to address the challenges they face.

Having held a number of dialogue sessions to verify indigenous knowledge and practices, the community felt they needed to start discussing with the different extension officers in their area how they can bring the indigenous knowledge system, and the knowledge system represented by the extension service, to start collaborating on equal terms. They identified a number of elders with specific knowledge in the sectors of crops, culture, traditional human and veterinary medicine, and traditional ecological law. These were put into four groups according to the kind of extension services available at the sub-regional office:

1. Environment and Water
2. Agriculture
3. Health
4. Culture and Education

In March 2015, a meeting between elders and government extension officers under the four themes was held, with the aim of promoting harmony and synergy between diverse knowledge systems for enhanced ecosystem governance in Masinga. The meeting provided a platform for representatives from the community and the extension service to discuss how they would synergize their expertise for the benefit of the people and with respect for one another’s knowledge and knowledge system (indigenous and western science respectively). A number of examples were given on how this synergy could work:

A key outcome of the meeting was an acknowledgement by all the groups that there is an urgent need for the different knowledge systems to work together. In moving forward, they agreed to keep exchanging ideas and information on the various priority subjects, as they clarify how the newfound collaboration will be made to work for people and territory.
Establishment of a community learning centre

The community research group has been pursuing their mandate with much zeal. From their experience, they have advised the community that the most appropriate strategy for them to make good use of the knowledge and seeds they are recuperating is to have a community learning centre, where the seeds recouped will be multiplied, new skills will be taught, important indigenous knowledge and cultural practices will be shared, and other innovative technologies developed. This is the space where the community envisages that the different knowledge systems will connect for joint analysis of challenges facing the community and developing action plans.

The community has decided to acquire land and set up the centre using their own resources, so that they can control the terms and intensity of engagements with outsiders from other knowledge systems, such as scientists and government people. They have formed an organisation and started contributing money to purchase the land. This is an initiative in line with the newly launched network of Indigenous and Local Knowledge Centres of Distinction. The network consists of Indigenous peoples and local community organisations engaging in protection and promotion of indigenous and local knowledge on the ground and in IPBES, CBD, UNFCCC, SDG and other knowledge processes that relates to biodiversity and its governance. Composed of organisations implementing programs on traditional knowledge all over the world, the Centres of Distinctions network aims to be a support mechanism for delivering inputs into IPBES and other processes by indigenous and local knowledge holders themselves.
Conclusions about methods used and piloted

**Reflections on eco-cultural calendars**
- Eco-cultural calendars are a strong community research tool which can support a process to revive a whole socio-ecological system, as they embrace the whole “universe”.
- Eco-cultural calendars are also essentially a community planning tool, which can be used to develop community ecological governance plans towards revival of socio-ecological systems
- Eco-cultural calendars are useful in bringing to the fore the important cross-gender collaboration as they show the different but complementary roles of men and women, boys and girls. The roles of either gender need be fulfilled for those of the other gender to be useful.

**Reflections on the Multiple Evidence Base approach**
This was the first time a Multiple Evidence Base was applied to the eco-cultural mapping process. The philosophy that underpins MEB puts respect and the value of reciprocity in exchanges across knowledge systems at its core. These principles are well rooted in the processes involved in eco-cultural mapping. However, before exchanging across knowledge systems, the mobilisation of indigenous knowledge within the unique knowledge system is critical. This is something that became apparent in both Tharaka and Masinga, where one of the key outcomes of the mapping exercise was the positive collaboration with the governments and their representatives. Without mobilising indigenous knowledge at the very start of the process, such an outcome would not have been possible.


Recha, C. S.W (undated). Climate Variability and Adaptive Capacity in Semi-arid Tharaka District, Kenya. Kenyatta University, Department of Geography, P. O. Box 43844 GPO 00100, Nairobi, Kenya

About the report
This report presents the outcomes of a collaborative partnership between African Biodiversity Network with Institute for Cultural Ecology (ICE), Kenya and SwedBio for piloting a Multiple Evidence Base approach to co-generate knowledge and methods for mutual learning across knowledge systems.

The project has contributed to the Tharaka and Kivaa communities capacity to take actions for protecting their biodiversity, food and culture based on revitalization of local knowledge and practices. For example, local seed varieties have been recovered, and a plan of action between communities and governments is agreed for rescuing Kathita river and its sacred sites. A learning centre has also been established.

African Biodiversity Network
African Biodiversity Network is a network of individuals and organisations working passionately across Africa in 12 countries at local, national, regional and international levels to avert social injustices and environmental destruction arising from the contemporary development paradigms in order to enable local communities control their lives and livelihoods while celebrating their social, cultural, spiritual and ecological diversity. ABN envisions vibrant and resilient African communities rooted in their own biological, cultural, and spiritual diversity, governing their own lives and livelihoods, in harmony with healthy ecosystems. Institute for Culture and Ecology (ICE) is one of ABN partner organisations working to empower communities to harness indigenous knowledge for healthy people and ecosystems.

Swedbio
SwedBio is a knowledge interface at Stockholm Resilience Centre contributing to poverty alleviation, equity, sustainable livelihoods and social-ecological systems rich in biodiversity that persist, adapt and transform under global change such as climate change. SwedBio enables knowledge generation, dialogue and exchange between practitioners, policy makers and scientists for development and implementation of policies and methods at multiple scales.