MELCA-Ethiopia
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# Proceedings from International Conference on Participatory Mapping for Sustainable Life
Addis Ababa, Ethiopia

and

Report on Trainings in Participatory 3-Dimensional Modelling
at Dinsho in Bale, Holeta in Suba-Sebeta
and Masha in Sheka, Ethiopia

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List of Acronyms

ABS	Access and Benefit Sharing
CBD	Convention on Biological Diversity
EIA	Environmental Impact Assessment
FDRE	Federal Democratic Republic of Ethiopia
GIS	Geographic Information System
IPR	Intellectual Property Rights
IUCN	International Union for Conservation of Nature
LVIA	Lay Volunteers International Association
MELCA	Movement for Ecological Learning and Community Action
NGO	Non-Government Organization
PGRC	Plant Genetic Resources Centre
PM	Participatory Mapping
P3DM	Participatory three Dimensional Model
PGIS	Participatory Geographical Information System
PRA	Participatory Rural Appraisal
PLA	Participatory Learning Approach
RRA	Rapid Rural Appraisal
RFF	Rain Forest Foundation
SNNPR	Southern Nations Nationalities Peoples Region
SEGNI	Social Empowerment through Group Nature Interaction
UK	United Kingdom

Proceedings from International Conference on Participatory Mapping for Sustainable Life

Ghion Hotel, Addis Ababa, Ethiopia
15th-16th November, 2010

EXECUTIVE SUMMARY

MELCA organized an International Conference on Participatory Mapping for Sustainable Life, held on 15th and 16th November 2010 at Ghion Hotel in Addis Ababa. A total of over 90 participants from offices of the Federal as well as the Regional Governments of the FDRE, representatives of different universities, representatives of civic societies and local communities, as well as representatives of civic societies from other countries and internationally renowned experts in participatory mapping, attended the conference.

Participatory mapping experiences from different countries, including Ethiopia, were presented by representatives of local communities and civic societies. There were also presentations by experts on the significance of the various kinds of participatory mappings for revitalization of indigenous knowledge, intergenerational learning, participatory planning and resource management, environmental protection, empowerment of community, and community based research and education.

The conference included participatory mapping experiences from the Congo Basin and Central Africa, Colombia, South Africa and Ethiopia.

Mr. Georges Theory, an environmentalist from RFF, provided a conceptual meaning of participatory mapping accompanied by an experience of the use of participatory mapping for community empowerment in the Congo Basin. Georges stated that participatory mapping is a process, which puts modern knowledge of cartography together with active involvement of community members and local traditional knowledge, to produce a community based map showing bio-cultural resources of the community. He described it as a tool for creation of a space or forum where the community meet and discuss their social and economic problems, for effective environmental protection and bringing social change and development in communities.

He also presented how participatory mappings are used in the Congo Basin countries to empower local communities to claim their right of access to land and natural resources. In this presentation Georges showed that certain indigenous communities in the Congo Basin region, who were devoid of their right of access to land and resources by their national statutory law, have succeeded in getting the laws revised and their rights reinstated. The communities were able to do this, mainly, as a result of the process of mapping their land and resources.

Likewise, Ato Biniyam Teshale, from LVIA, presented mapping experiences from the pastoralist areas of Ethiopia, which integrate modern scientific Geographic Information System (GIS) with the traditional knowledge of the community.

Another presenter, Norma Zamora, from Colombia, presented how participatory mapping is used in the Pira Paraná region of Colombia, for community based natural resource management, school curriculum development and community centered research.

The experience from Colombia shows that community based research, which involves mapping an area of the community, is conducted through active participation of the indigenous communities in the process. Although there is also an involvement of experts in the field, their role would, in most cases, be limited to facilitating a conducive environment for the community to undertake the research. In this way the community will come up with a research result they own and use to solve their socio-economic problems.

Representatives of the Bale and Telecho community from Ethiopia and representatives of the Venda community from South Africa also presented participatory mapping experiences and outcomes gained as a result.

From Ethiopia, a representative of the Telecho community, Ato Mulugeta Tafa and Representatives of the Dinsho community in Bale talked about their participation in a process of sketch mapping and preparation of traditional eco-calendars in their respective communities. They described how participation in the mapping process has motivated and empowered their communities to take corrective measures against environmental degradations prevailing in their communities. Community representatives also showed how their communities prepared traditional eco-calendars and used these to teach school children alongside the formal syllabus.

Presenters of the experiences from South Africa also recounted how local communities have made use of participatory mapping for environmental rehabilitation, natural resource conservation, and participatory planning.

Each of the presentations was followed by question and discussion sessions to clarify some of the ideas raised during the presentations.

There were also film shows of participatory mappings that reinforce the ideas expressed in the presentations.

After this series of presentations, discussions and film shows, participants of the conference were divided into groups and deliberated on four thematic issues relating to participatory mapping: i) how the use of participatory mapping can be spread for protection of the environment, ii) how to use participatory mapping for education or learning, iii) how participatory mapping can be used for community based research, and iv) how participatory mapping can be used to empower communities to demand and exercise their constitutional rights.

The groups dealt with the challenges pertaining to their respective thematic areas and possible ways of overcoming the challenges. Ways and means to be employed for sharing and spreading participatory mapping experiences in different countries were also suggested during group presentations.

The ideas raised by each of the groups were developed with relevant input by participants from the other groups during.

Finally ideas on how to implement and utilize participatory mappings for a common goal of proper resource management and creating a healthy ecosystem were raised as a way forward.

Participants of the conference have underlined the necessity of awareness raising, mainstreaming and networking activities regarding participatory mapping, to get the best out of participatory mapping processes in the future.

It was agreed that each participant of the conference should promote the implementation and utilization of participatory mappings for sustainable life in their respective institutions.

PROCEEDINGS OF THE CONFERENCE - Day 1

1.1 Keynote Speech, by Dr. Melaku Worede

Dr. Melaku Worede is an internationally acclaimed plant genetics researcher.
He won more plaudits for establishing the Plant Genetic Resources Centre (PGRC), a 'Strategic Seed Reserves' of traditional varieties that could be released to farmers for planting in times of drought when no other seeds were likely to thrive.

In 1989, he was honored with the Right Livelihood Award, commonly referred to as the Alternate Nobel Prize, for "preserving Ethiopia's genetic wealth for the benefit of all humanity".

Dr. Melaku, who has retired now, is the chairperson of MELCA-Ethiopia's Board. Dr. Melaku, welcomed the participants to the meeting, especially those who came from other countries, and said that the meeting is a great opportunity for those who are concerned with the erosion of bio-cultural diversity because it will show them how to recuperate it. He stated, "I am sure all relevant issues will be discussed in this meeting at the time when the world is facing adversity in climate change emanating mainly from the erosion of bio-diversity at a global scale." He then welcomed the participants, once again, and declared the meeting opened.

1.2 Introduction to MELCA-Ethiopia, by Ato Million Belay

Organizer of the meeting and Director of MELCA-Ethiopia, Ato Million Belay, said that "*melca*", in one of the widely spoken local languages, Oromiffa, means a 'crossing point' on a river. This meaning of 'crossing point' has been used by MELCA-Ethiopia as a symbol for the connection between culture and bio-diversity, elders and youth, local and non-local knowledge: core activities in which the organization is engaged.

Dr. Melaku Worede, Ethiopia

Million presented the vision, mission and values of MELCA as well as its programs/projects and areas of intervention. MELCA works on environmental education, environmental advocacy, participatory mapping, livelihood improvement, ecosystem rehabilitation and information dissemination.

MELCA works on participatory mapping to create an environment for local communities where they learn together in their social context and use their learning to change what is wrong in their environment. It empowers local communities to exercise their constitutional right of reclaiming their land and their culture. MELCA started using participatory mapping to link local communities with schools. This will hopefully narrow the gap that formal education is creating between the old and younger generation. MELCA has also facilitated Participatory 3-Dimensional Modeling in Bale, Sheka and of the Wechecha Mountain in its Suba-Sebeta project area.

Through its advocacy program MELCA is trying to influence policy and law related to environment and the culture related with it. It empowers local communities through educating them about their rights enshrined in the constitution. MELCA also works in empowering law enforcement as one of its advocacy activity.

Ato Million Belay, MELCA-Ethiopia

1.3 Keynote Speech by Georges Thierry, from RFFUK

Georges Thierry is an environmentalist with lots of participatory mapping experiences in the Congo Basin countries, which include Congo Brazzaville, Cameroon, Central African Republic and Gabon. He currently works with a UK based NGO called Rain Forest Foundation (RFF).

In his keynote speech, Georges said that he works in the Congo Basin countries with local communities on participatory mapping; to empower them to exercise their rights, resolve conflicts relating to border and other social and environmental issues. He said he is keen to share his experiences with participants of the conference in the making and effective utilization of participatory mappings and hopes to learn new experiences from other places.

He welcomed all the participants to this important conference, to share valuable experiences regarding the participatory mapping for addressing environmental and socio-economic problems.

1.4 The Concept of Participatory Mapping, by Georges Thierry

Georges started his presentation with a general definition of what participatory mapping is. He said participatory mapping is a process, which puts modern knowledge of cartography together with active involvement of community members. He stated that the most important aspect of participatory mapping is the process. The process creates a forum for various sectors of the community to meet and discuss the natural resources belonging to them, problems related to their utilization, as well as their relations with other communities or the government. It is also the ideal opportunity for the revival of traditional knowledge and for intergenerational learning.

Georges depicted participatory mapping as a key tool for effective environmental rights protection. According to him, protection of people's rights is a precondition for protection of an environment in a given locality. Local communities want their rights protected in order to protect their environment. And participatory mappings are the best way to work in close collaboration with local communities regarding their rights to land use, resource utilization, protection of bio-cultural resources and intellectual rights. In the process of participatory mappings, said Georges, we can learn from local communities how to help them protect what they want to protect.

Georges Thierry, Rain Forest Foundation

Regarding the value of participatory mappings he said "they are very important entry points to bring about social change and development in local communities. In the mapping process members of the community work together to combine the information they have about their locality. The enhanced participation of the local community would, at the end of the day, increase their understanding of their area thereby increasing their participation in participatory planning of development projects in their area and local decision-making. This in turn has the effect of initiating the community to be involved in monitoring and evaluation of planned activities thereby increasing government accountability to the community."

Regarding community participation in land use and natural resource management plans, the new approach being promoted by IUCN is that there should be full participation of communities in the protection and conservation of biological resources. As such participatory mappings allow meaningful participation of the local community, which is in conformity with this principle.

The other uses of participatory mappings, as presented by Georges, are their use as key instruments for managing conflicts pertaining to border issues and resource use and management. This it does by way of creating a forum for conflict resolution through discussion based on tangible observations. The other crucial significance of participatory mapping relates to its being a tool for intergenerational learning, community cohesion and self actualization.

He also mentioned their significance in the protection of the intellectual property rights of local communities in line with the principles of Acess and Benefit Sharing (ABS).

Questions from participants

1. What is the difference between modern mapping and participatory mapping? And how is it possible to sustain community's

Georges Thierry, Rain Forest Foundation

traditional activities with out causing degradation to the environment?
2. How can participatory mappings be used for the protection of Intellectual Property Rights (IPR) ?
3. How can participatory mappings be used to resolve conflicts?

Responses

In response to the first question Georges said that the similarity between modern and participatory mappings is that both are intended to map a given area and the resources within. The difference is that modern mapping is done with experts having the required modern knowledge in the field without the participation of the community living in the area while participatory mapping is done primarily by the community in that given locality, making use of their traditional knowledge of their area with limited incorporation of the modern cartographic knowledge. As participatory mapping allows community participation and is based on the reality of people living there, its implementation for a better living is more effective. It is proved through studies that where communities are allowed to take part in their local affairs there is better conservation. The participation would place a sense of belonging in them and they would say to their environment 'this is mine'. As a result there would be better protection of the environment and better conservation of natural resources.

Regarding the issue of Intellectual Property Protection, Georges said that the principle is giving value to the traditional knowledge of the community. Traditional knowledge should be recognized as a property of that particular community and should be protected by law. This is also in line with the principle of ABS, which is part of the Convention on Biological Diversity (CBD).

Regarding the use of participatory mapping for conflict resolution, Georges stated that in the process of developing participatory mapping, communities would have intensive discussion regarding the natural and traditional resources within their area. They would also be able to easily identify their territories based on tangible observations on the maps and come to terms with the concerned community through the discussion they have on the spot.

1.5   Film: P3DM- Good PGIS Practice

The film shows the history of mapping and how maps and their uses have changed over time. It particularly shows how the concept of mapping changed in the 21st century with the prevalence of modern information technology and how the concept of participatory mapping evolved. In the narration of the film it was mentioned that mapping has become more and more participatory and a key instrument for resolving social and environmental concerns.

Participatory mapping as a communication tool, empowering local communities and specially its advantage for disadvantaged groups, effective resource management and conflict resolution, were some of the values depicted in the film. Ethical issues were mentioned including who gains and who loses in the participatory mapping process.

The various steps in participatory geographic information systems (PGIS) were shown. As the process is a community based process there is no fixed way of doing it and there should be flexibility in its application.

1.6   Participatory Mapping for Participatory Planning and Natural Resource Management, by Ato Biniyam Teshale from LVIA

Ato Biniyam presented the mapping experiences of Lay Volunteers International Association (LVIA) in the pastoralist areas of Oromia Region, Borena and Moyale. He presented that the mapping experiences in the context of LVIA mainly includes two tasks: participatory community mapping and the digitization of the maps produced by the local communities.

According to his presentation, in the first task members of the community come together and do ground mapping. On the ground map they show the various natural resources in the area and their distribution. The purposes of the mappings are to create discussion forum for the community, to understand the location and distribution of their natural resources and to see the human and livestock mobility in the area.

Then the ground map done by the community is transferred to paper map and then digitized using GIS.

Biniyam stated that they employ three methods for the engagement of communities in local decision-making. They are, Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA) and Participatory Learning Approach (PLA). These methods are used to help the community analyze realities in their area and find solution to their problems, plan development activities and be part of monitoring and evaluation of planned activities.

Regarding the outputs gained as a result of the participatory community natural resource mappings, he stated that around 900 hectares of degraded rangeland have been rehabilitated based on the information obtained from the participatory maps. As such the participatory community maps have been used as a tool for communicating with the community easily.

Ato Biniyam Teshale, LVIA

Finally he mentioned low cost and non dependency on modern technology as advantages; and lack of accuracy, difficulty in transposing to scale maps, and the fact that it is not geo-referenced as limitations of participatory ground mapping.

Questions from participants

1. Can the community be able to understand geo-referenced maps?
2. Does your organization have institutional connection with government offices?
3. How do you describe community participation in your mappings?
4. How do you update your mapping in line with the change in the environment?
5. From whose perspective do you say the ground maps done by the community lack accuracy?

Responses

Regarding whether the community can understand geo-referenced maps, Ato Biniyam said that first there are ground maps done by the community. These are transferred to GIS, just to fill the gaps in the map by the community. In doing that the community are well introduced to the geo-referenced map.

As to the institutional connection with government offices, he said his organization works with the concerned government sector

at every level and for that matter it not only gets its projects approved but also gets the maps validated both by the community and the concerned government organ.

Regarding the issue of community participation Biniyam said the primary aim of the participatory mappings they do is to support the community take part in project planning in the pastoralist area and help them find solutions to their problems. As such there is community participation in all the activities.

He also stated that the mapping they do is effective until the date of its publication and it can be updated in line with changing situations any time after that. And regarding the concern relating to accuracy he said the ground map by community members is full of information and it is accurate for the community that produced it. The lack of accuracy comes when the ground map is translated in to the modern one.

1.7 Community sketch mapping, by Ato Mulugeta Tafa

A representative of the Telecho community, Ato Mulugeta Tafa, presented the participatory sketch maps they have done in their locality, assisted by MELCA-Ethiopia. These maps have helped them identify what they have lost and what they have now. He said MELCA facilitated the mapping process including provision of the necessary materials., and that MELCA in collaboration with Environmental Protection Authority and Institute for Sustainable Development has organized an experience exchange visit with communities in Amhara and Tigray regions who managed to rehabilitate degraded lands. He also stated that their association has been getting the required support from the local administrative organs through out all their activities.

He stated that "from the outset we have done three maps: the first one that shows the feature of our locality 30-40 years ago; the second which shows the current situation and a third one which shows the environment that we want to

have in the future." As described by Mulugeta, "in the map of the past there were trees, rivers, springs, pasture and various species of wild animals, whereas the map of the present shows few or none of these. Rather we see barren and degraded land as well as dried rivers and springs on the map of the present. Then, after an intensive discussion on the issue we prepared a third map, which shows our plan for rehabilitating our environment."

Mulugeta stated that it did not take them much time, after preparation of all the three maps, to agree, as a community, on the issue of environmental protection and rehabilitation and what to do to conserve their environment. He said, "the maps made us realize the situation we are in and where we are heading to. So we immediately organized ourselves into an environmental protection and rehabilitation association, prepared an action plan and started to act in accordance with the plan. There is now demand from many farmers to be member of our association and we are planning to act accordingly."

Mulugeta also mentioned that their association is engaged in the preservation of traditional seeds, which are found suitable to their area.

Ato Mulugeta Tafa, Telecho community

Questions from participants

1. What capacity do you have to implement your plan as you have described it in the map of the future?
2. When you try to implement your plan of rehabilitation, did not you face resistance from others who do not want their land to be included in the rehabilitation activity?
3. What is the value that you have gained from the mapping process? Is it not rather time consuming?

Responses

Responding to the question regarding capacity, Mulugeta said that their capacity to implement the plan emanates primarily from the manpower they have. In addition he said, "we have awareness raising workshops with MELCA, and on top of that we acquired practical knowledge as a result of the experience of visits to other regions. We also have the necessary support from relevant government organs."

Regarding the concern about the resistance they may face from some farmers, he responded that it is true that they faced such resistance from some farmers at the beginning. He said, "we resolved such problems by requesting the resistant farmers to work on terraces on their plot of land so that the water flowing from their land would not damage the terraces we do downstream. In that way they become part of the rehabilitation effort."

As to the value they got from the maps, he said the first thing is that the maps made them more aware of their environment. He said "it did not take us much time to act after we saw the difference between the map of the past and the map of the present. So they helped us to get in to work immediately.

1.8 Community sketch mapping, by Ato Aman Mame

Presenting the community mapping experience of the Horo Soba community of Dinsho District,

Ato Aman said that all sectors of the community - elders, religious leaders, the youth, students, local administrative organs and representatives of relevant local government offices - have participated in the mapping process.

Regarding the process, Ato Aman said that they prepared three kinds of maps: the first one shows what their area looked like 30-40 years ago, the second shows the current situation and the third one shows the feature of the locality they want or plan to make in the future.

He explained that preparation of the map of the locality 30-40 years ago was mainly dominated by elders as the youth do not know the situation then; the second one is prepared mainly by the youth guided by elders; and the map of the future is prepared through the participation of all members of the community.

According to Ato Aman, after the map of the past and that of the present were prepared, looking at the difference in the environmental set up between the two maps alarmed all members of the community. The first map showed hills and terrains totally covered by varieties of trees, rivers, springs, grasslands and different kinds of wild life species, while many of these things are non existent on the map of the present. Then an intensive discussion was held before preparation of the future map. They agreed that every member of the community should take part in the rehabilitation of the environment to make their future map a reality.

The other use of the mapping process, as stated by Ato Aman, is that it created a forum on which the youth would learn traditional knowledge and environment related issues from elders. He said, "We have found that participatory mappings create a very important opportunity to realize the situation of our environment. It allowed us to see what we have and what we have lost in terms of our natural resources. As a result we discussed and decided on what we should do to avert the situation. What we found most important is the process of the participatory mappings. As the process involves

Ato Aman Mame, Horo Soba community

the youth and students, we had the opportunity to discuss with them and learn from each other. We know much about our local environment and the biodiversity as we learned from our fathers. The youth who were with us on the mapping process, on the other hand, do not know most of the rivers, trees and sacred sites that were mentioned by elders on the map of the past. That is so because the tendency of learning traditional knowledge from elders is being gradually eroded with the expansion of modern education. The current generation tends to ignore local traditional knowledge and stick only to modern education. The process of participatory mapping is a good opportunity to change this trend. We got the chance to teach what we learned from our fathers to our children. Now they have also realized that they were lacking what is very important for them. So we hope they will also do the same to their children and the missing link will be reinstated."

Ato Aman added that they have shown the sacred sites of their community in the maps and, as the maps are displayed in the administration office of the district anyone interested in learning about these traditional places can visit the maps and learn.

Finally he stated that concerted efforts by the community assisted by the local government administrative organs are underway for rehabilitation of the environment, and good results are being observed.

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Questions from participants

1. Did you discuss the reasons for the degradation of the environment while making the maps?
2. Does the community have a time frame for realizing their future plan as depicted in the map of the future?
3. How can we believe that you do not you have other motives (such as getting aid) behind making such future plans, which seem so ambitious?
4. How do you get seeds of lost trees to reinstate the lost indigenous trees?

Responses

Regarding the first question, Ato Aman said that they had intensive discussion and identified the main reasons for the degradation to be population growth and expansion of agriculture.

As to the time frame for their plan he said the community has set short and long term plans for the rehabilitation. In the short term it is agreed every member of the community should conserve the existing trees and they have agreed to be involved in planting of trees as a long-term plan. They have also planned to do soil and water conservation activities.

For the concern that regarded their plan as ambitious, Ato Aman said the plan is really achievable. He said, "we have seen that simply protecting a portion of land for some time would make it revive within a short period of time. If we conserve existing trees and plant additional trees beside the protection, we will achieve our plan for sure. We are also aware of the fact that doing this is crucial for us and for the future generation. That is the only motive behind, that I know, the rehabilitation plan,"

For the question regarding seeds of lost trees, Ato Aman said that if the land is protected the trees will start to grow by themselves. Besides they can get seedlings of any indigenous tree from nursery sites and research institutions.

1.9 School Community sketch mapping, by Wrt. Gete Asefa

Gete is from the same community as Ato Aman Mame. She is a teacher at Gesse primary school of the Horo Soba community. She is also a leader of SEGNI (Social Empowerment through Group and Nature Empowerment, a programme of MELCA-Ethiopia, creating responsibility among youth for their environment and cultural legacy) and an environmental protection club in the school. She presented the participatory mapping experience by the school community.

The mapping process by the school, which also involved other members of the community, as presented by Gete, is basically similar to the ones presented by representatives of the Telecho community and Horo Soba community. But it differs in that it included preparation of an ecological calendar and the involvement of students as the main actors.

According to Gete, the eco-calendar contains traditional knowledge based around seasons of the year and the various activities and traditional celebrations that are undertaken within each season. At the end of the day they found out that there are five seasons in the traditional eco-calendar while there are only four seasons in the formal syllabus they teach in the schools.

She described the four seasons in the formal syllabus as *Birra* (Autumn), *Bona* (Winter), *Afrasa* (Spring), and *Genna* (Summer), while the five traditional seasons are *Birra* (which includes October and November), *Bona* (which includes December and January), *Beddessa* (which includes February, March and April), *Chaamsa* (which includes May and June) and *Genna* (which includes July, August and September).

She also described seasonal works, the weather condition and traditional events/celebrations in each of the five traditional seasons. For example, prayer by elders for optimum rain is undertaken during *Genna*, as it is a rainy season, *Birra* and Bona are wedding seasons, and *Beddesa* is a season of *Atete* (a ritual undertaken by women).

Wrt. Gete Asefa, Gesse primary school

She said, "we realized the mismatch between the two eco-calendars happened as a result of the school syllabus which is prepared based on the national calendar, which does not take the realities of a particular area in to account. So we tell our students that the eco-calendar, which is relevant to our area, is the one which is prepared by the community and they have to know both"

Regarding the significance of the participatory maps and the traditional eco-calendar, she said that primarily the maps have made the youth understand their environment and motivated them for rehabilitation.

Secondly, both the maps and the eco-calendar served for the transfer of traditional ecological knowledge from elders to the children and youth. Thirdly, both are being used as teaching aids so that children would better understand the relationship between their culture and their environment.

Questions and Discussion

Gete was asked to explain the relationship between the maps and the eco-calendar. She responded that the eco-calendar is used to properly correspond the rehabilitation activities with the appropriate seasons. For example they would know when to prepare the holes and plant tree seedlings.

1.10 How Participatory Mapping is used for developing local curriculum in the Pirá Paraná region, Colombia, by Norma Zamora

Norma Zamora, from Colombia, presented how participatory mapping is used by communities in the Amazon for developing their own school curriculum and for doing community based research. She presented the experience of the Pirá Paraná region of Colombia, which is rich in biological and cultural diversity.

Norma explained that the new Colombian Constitution in 1991 provided the framework for indigenous people to begin governing their territory. They used participatory mapping for this process. In the mapping process the communities produce the map of the past, that of the present and the map of the future. The community incorporates the resources, their settlements as well as sacred sites in the maps they produce. The youth, who participate in the mapping process, often do not know the rivers and sacred sites designated on the maps of the past by elders. They learn them for the first time from the maps. So the mapping process helps as a means for intergenerational learning.

According to Norma, the mapping process also includes preparing the ecological calendar of that particular community. In the ecological calendar the climatic condition throughout the year and the various activities and traditional celebrations are depicted. The community calendar did not previously match with the formal calendar in schools, and the academic curriculum did not take into account the reality for indigenous communities in the Amazon. So the elders were concerned. Based on the resource maps and the ecological maps, the communities in the Pirá Paraná region began to demand amendment to, firstly, the school calendar and later to the academic curriculum of education. They achieved both, and the national government of Colombia accepts indigenous programs for inter-cultural education.

At present, as stated by Norma, school children learn their eco-calendar. They also learn about their environment from elders including the history and origin of each ethnic group. After each lesson elders would evaluate the children on what they learned. Along with this the children also learn how to use modern technology. The education system in the Pirá Paraná region is officially accepted by the government of Colombia and is considered exemplary in terms of transfer of traditional knowledge from elders to the youth.

Questions and Discussion

1. How and by whom was participatory mapping first initiated in Colombia?
2. Has the participatory mapping been also integrated in the junior secondary schools?
3. According to your presentation, the local community is emphasizing traditional knowledge; do you not think the modern western knowledge is also important?
4. How do local communities in Colombia explain illnesses associated with season?

Responses

Regarding initiation of participatory mapping in Colombia, Norma said it all started with the demand for change in the Colombian constitution. The indigenous people were struggling for changes in the constitution and

Liz Hosken (left), Norma Zamora (right)

part of the struggle was to get the rights and territories of indigenous people recognized in the constitution. As such the local community started to prepare maps to substantiate their claim for territory, access to resources and traditional practices.

As for the integration of participatory mappings in the junior secondary schools, she said that the community is working to incorporate it in both the junior secondary and secondary schools. She emphasized that the children have to know first their own people and tradition before trying to learn about others. If they know about themselves very well, they will learn about others easily. So they also learn western knowledge beginning from junior secondary school.

Regarding some diseases associated with the seasons, Norma said indigenous people believe that some diseases come from the forest. To avoid such diseases they do particular rituals every season.

1.11 Lessons Learned and Concerns

The first day of the conference was concluded with comments from participants about lessons learned during the day. They also raised their concerns.

The following were noted as lessons learned:
*   local communities can explain their environment well through participatory maps;
*   participatory maps can better tell the relationship between culture and bio-diversity;
*   participatory maps are powerful tools for community based environmental rehabilitation;
*   participatory mapping is a good instrument for identifying problems in community and to indicate the solutions;
*   participatory mappings are democratic approaches for the learning of spatio-temporal knowledge of the local communities.

The following are among the concerns regarding participatory mappings, as raised by the participants:

- the act of digitizing community maps may expose the local knowledge to bio-pirates;
- community mapping does not seem sensitive to issues like population increase and globalization;
- participatory mappings may have unintended and undesired consequences;
- the participation described in participatory mappings might not be genuine;
- the problems that can be addressed through participatory mappings may not have been dealt with exhaustively.

Day 2

2.1 Social Mapping & Local Research - an experience in Colombia, by Norma Zamora

Norma presented again, this time with a focus on how participatory mappings are used, in Colombia, for community based local research. She explained how participatory mappings give the local community an idea of who they are, what they have, what problems they have and how they should address them on a priority basis. To address the problems identified through mapping the community can become involved in a research that is fundamentally based on their own indigenous knowledge but is also open to the modern knowledge.

As the participatory mappings allow the participation of every member of the community there is a triangulation of ideas for analysis of information and a chance to come up with the best solution to a particular social or economic problem. Experts also participate in the problem identification and analysis. But their role is limited to assisting the community find the appropriate solution to their problems. During the process, participants learn not only about their environment but also about the traditions of their community.

In such a way experts with academic research methodologies can work with the community to arrive at a common goal of problem solving based on indigenous knowledge. So we can say this is a different way of using maps as a way of combining the two systems of knowledge, western and traditional knowledge, for analyzing information and reaching a solution to a problem.

Norma presented that the research is done in three phases. In the first phase information regarding the resources that the community need from the forest and rivers is collected. Then in the next phase members of the community would discuss and identify the location of the resources they need from their environment; for example where they can get medicines, fish, food items etc. At this stage they also analyze in detail their agricultural system. And in the third stage of the research they analyze the situation of the resources and whether they still exist and work, lost or to be lost. At this stage they use different colors to show the situation of the resources. They use green for a resource that is healthy and is still working, yellow for a resource that is about to be lost and red for an endangered resource. From this process the community learn the situation of their resources and start to analyze reasons for the loss of the resources and think of what action they need to take to reinstate them.

To illustrate the procedure Norma presented how a community called Bocas Delly, in Colombia, worked together with researchers to identify and resolve a problem related to fish, on which their depend for their subsistence living. There were lots of fish in some parts of their area while there is no fish at all in some other areas. The community worked with the researchers to find out the reason why that is so. They gathered relevant information, such as when and how the communities residing where the fish populiation is low used to fish previously; how the communities in the other places manage their fish resources; and devised a mechanism for proper way of reclaiming the fish in the future.

Norma also presented a case in which a young researcher, who is working on the case of over hunting, learned from an elder and came up with the best research result. As the research involved participatory mapping of the different territories, it formed the basis to work with the community to properly identify the causes of the problem and set solutions that can be implemented by the community.

The lessons learned from the community based research experience in Colombia, as stated by Norma, are that the purpose of the research should be made clear to the community in order for them to fully participate in the process. Along with this the community should also be aware of the duration within which the research will be completed, and that they will be the owners of the research and its results at the end of the day. These are among the major requirements we have to strictly observe while supporting community based research, to get the intended results and for the link between indigenous and modern bio-cultural knowledge to be strengthened.

Questions and Discussion

1. How often local communities do such research and on what basis do the communities select the subject of the research?
2. Who takes the initiative for the researches and what is the role of the government?
3. What if the researchers want to do the research on their own?

Responses

Regarding the question related to the frequency in which research is done Norma responded that, as the research is done by the community themselves, they are done periodically when there are problems to be dealt with. The community identifies the problems that should be addressed by the research, and the initiative of conducting research comes from them. Hence the primary basis for any community-based research is problem identification.

As to the role of the government in the community-based research Norma said that the government assists the community by way of financing the research together with other interested NGOs. The idea is that no researcher can do research in a community by being completely independent of assistance from other members of the community. He/she at the least needs some informants. So there is involvement of the community in one way or the other. Hence the principle is that research done in the community should contribute to the life of the community.

2.2 Mobilizing Communities for Advocacy Using PM - an experience in the Congo Basin, by Georges Thierry

Georges started his presentation by introducing the Congo Basin to the participants. He said that the area referred to as the Congo Basin contains countries such as D.R Congo, Central African Republic, Gabon and Cameroon, and the Congo Basin rain forest covers around 180 million hectares of land spreading across D.R Congo, most of Congo Brazzaville, the south east of Cameroon, southern Central African Republic, Gabon and Equatorial Guinea. The area is known for its rich bio-diversity. Over 10,000 species of plants, 1,000 species of birds, and 400 species of mammals are found in the area and the indigenous people of the area are people who want to protect their resources. He also described the area as a home for over 50 million people including up to 500,000 indigenous "pigmy" hunter gatherers, many of whom depend on forest resources for their living.

Then, Georges presented an experience in the Congo Basin, pertaining particularly to local communities in Cameroon on how participatory mappings are used to empower them to claim their right of access to land from the government. According to his presentation the Government of Cameroon has denied certain indigenous people, who are hunter- gatherers, access to a portion of land in their locality

because the government declared the areas they inhabited and use for search of food and other resources as vacant. This is done without any consultation with the concerned community.

Under the statutory law and Bantu Customary law, hunting and gathering is not seen as conferring use and ownership rights in the same way as farming or herding. The rights of the communities using the land within the boundaries of the concessions is severely restricted due to such laws. As a result the communities were facing marginalization and impoverishment. Furthermore, their sacred sites were being destroyed by big projects run by the government.

Participatory mappings were done in those communities to show that they are present, to claim their rights and to support community forestry. The mapping process included collecting data from the field, analyzing the data and transferring it in to GIS system. Then the community would validate the digitalized maps. Along with the preparation of the maps legal information was disseminated among the communities. And this has helped in improving the community's self-confidence in their dealings with the local administration and private companies.

At last the maps were produced and, together with certain legal information, were used to facilitate negotiation between the community and Bantu, the community and park managers, as well as the community and government and other stakeholders. The local community used the maps to claim their rights based on the legal provisions available.

Then, after many years of negotiation, an agreement was reached whereby the Bantu recognized the rights of the indigenous peoples' access to land and resources free of charge. The management plan pertaining to protected areas was also amended on the basis of the maps and now recognizes the rights of the indigenous people.

Georges Thierry, Rain Forest Foundation

Questions and Discussion

1. What solutions were used to minimize the effect of big projects on the environment?
2. How much area is covered by your community-mapping project? What challenges did you face?
3. Are the states in the Congo Basin signatories of international convention against stereotyping and marginalization?

Responses

Regarding the effect of big projects on the environment, Georges responded that they try to raise the problems to the government and push for the implementation of environmental impact assessment to reduce their effect.

As to coverage of the mapping project he stated that they have so far worked with almost 300 communities and they are thinking of extending their project to more areas.

In response to the concern regarding stereotyping and marginalization of some communities by governments, he said that most of the countries are parties to non-binding international treaties or even if they are party to the binding ones implementation of the laws is weak. But the governments claim that they are democratic governments as face value in their relations with western states.

2.3 Film: "Reviving our Culture, Mapping our Future"

The film tells the story of an exercise in eco-cultural mapping that was carried out with Tshidzivhe community in Limpopo province, northern South Africa.

This mapping experience involved local people as well as indigenous from other parts of the world. More than 70 vhaVenda people took part, guided by trainers in eco-cultural mapping from Colombia and accompanied by indigenous leaders from the Colombian Amazon and the Russian Republic of Altai.

Women, men and youth from Tshidzivhe community spent six days exploring ways to 'map' their traditional knowledge and practices for managing their natural resources. show on participatory community mapping. The film is also about how the indigenous community have started to use participatory mappings to restore their sacred sites and maintain their traditional ecological way of life.

2.4 Eco-cultural Mapping in the Venda Community of South Africa, by Mphatheleni Makaulule and Netshizivhe Tshilidze

The case of the vhaVenda people echoes throughout many other rural areas in Africa and amongst other groups of traditional and indigenous peoples – the loss of communally owned territories, the expansion of industrial plantations and non-sustainable forms of land and resource use including tourism, the erosion of cultural values and sacred sites.

The two presenters from South Africa presented the participatory mapping experience in their community with the theme "Reviving our culture, mapping our future" (title also of the film about this process). They presented how the Venda community used participatory mapping to assess the status of their bio-cultural resources, to combat problems related to their bio-cultural resources and to plan for their future.

According to their presentation, the community mapping process in the Venda involved drawing ancestral maps in which each of the sacred sites are indicated. Then they prepared maps of the present, which showed a dis-ordered landscape. They also did the future map, which depicts the environment they intend to have in the future.

Mphatheleni stated that her community used the participatory mappings in the dealings they have with outsiders in relation to their sacred sites. She described the Venda community is an indigenous community that wants to maintain their traditional way of life. They do have sacred sites where they undertake traditional rituals and ceremonies. The government and others who are outside of the community, on the other hand, want to take the areas where the sacred sites are found with a claim that they want to develop the areas.

Hence protecting the sacred sites has been a priority for the Venda community. Accordingly they used the community eco-cultural maps to build their confidence and empower the community to defend their claim to the area and the sacred sites. The maps helped the community realize the widening gap between the people, nature and spirituality. The mapping process gave them the opportunity to come together, discussion on the conditions prevailing in or encroaching to their locality and reconnect themselves with *mupo* (meaning 'everything in nature, air, Mother Earth'). She said the process enabled them to revive the rule of the community including that of the *makhadzis*.

The *makhadzis* (women elders and knowledge holders) are the ones who have the traditional knowledge of food, nature, spirituality, the eco-system and how to care for family. They are also the ones who have the spirituality that connect the community to ancestors. As such they are custodians of the sacred sites and undertake the rituals in the sacred sites.

After the mapping process and realization their situation as well as the pressure coming to them the *makhadzis* became confident enough to claim their right to the sacred sites. They initiated a court case for the protection of one of their network of sacred sites.

2.5   Group discussion and Presentation

2.5.1   Group discussion

Participants were divided in to four groups and discussed on four thematic areas:

1. How can we spread the use of PM for protection of the environment? What are the challenges? How can we overcome the challenges?
2. How can we use PM for Education/ learning? What are the challenges? How can we overcome the challenges?
3. How can we use PM for Research with local communities? What are the challenges? How can we overcome the challenges?
4. How can we use PM for Empowering community to exercise their constitutional rights? What are the challenges? How can we overcome the challenges?

2.5.2   Group presentations

After discussions on each of the thematic areas, each group presented its outcomes.

2.5.2.1 Presentation by Group One
To spread the use of participatory mappings for protection of environment:
*   A guideline for preparation of participatory mappings should be prepared and disseminated;
*   The use of participatory mappings for protection of environment should be incorporated into government policy and strategy;
*   Best experiences in participatory mapping should be scaled up by way of experience exchange and networking;

*   Participatory mappings should be incorporated into school curriculum;
*   The role of media should be expanded.

Challenges that could be faced in this regard are:
*   Resistance from local communities;
*   Policy makers may not regard participatory mapping as priority;
*   Resource limitation;
*   Inefficiency on the part of facilitators/ implementers.

2.5.2.2 Presentation by Group Two
In order to use participatory mappings for education or learning:
*   Indigenous knowledge should be expanded and integrated into school curriculum;
*   Teachers should assess traditional knowledge in their areas and try to transfer it to the youth in schools through extra-curricular activities such as clubs;
*   Discuss with education authorities to integrate participatory mapping in school curriculum.

Challenges that could be faced in this regard are:
*   The system of teacher training in the country may not support the idea;
*   The education system may not have room for indigenous knowledge
*   Lack of concentration, on the part of both teachers and students, on extra curricular activities
*   Students may be accustomed to spoon feeding way of learning and may not like learning by their own

Possible solutions to the challenges are:
*   Working towards intensive awareness creation among the various stakeholders;
*   Working with stakeholders to develop local curriculum;
*   Work for the establishment of problem solving education approach;
*   Mobilize local resources to support the idea.

2.5.2.3 Presentation by Group Three
To use participatory mappings for community based research:

- Create an enabling environment for the community to participate and set priorities;
- Promote culture sensitivity within local communities;
- Promote bottom up approach and encouraging a more participatory quantitative research;
- Promote multidisciplinary team research;
- Assess resource potential in the community;
- Strengthen the link between and among cultural, linguistic and biological diversity;
- Try to make the community based research as cost effective as possible;
- Include intellectual property right of the community to their traditional knowledge.

Challenges that could be faced in this regard are:
- Lack of conceptual and methodological clarity on the use of participatory mappings;
- Challenges related to the land tenure system;
- Lack of adequate time;
- Lack of infrastructure;
- Multitude of challenges (bio-diversity, natural resource, etc limitations).

Possible solutions to the challenges are:
- Organizing sensitization workshops on a regular basis;
- Involving government organs and signing memorandum of understanding;
- Constructing infrastructure necessary for the implementation;
- Prioritizing problems with the local community.

2.5.2.4 Presentation by Group Four
To use participatory mappings to empower the community to exercise their constitutional rights:
- Mobilize the community for reinforcement of existing laws;
- Avoid counter mis-information;
- Strengthen sense of identity of the local community;
- Encourage the community to have a say in resource management and utilization and decision making in their local affairs.
- Help the community to be organized; and get legal recognition.

Challenges that could be faced in this regard are:
- Lack of awareness on the rights of indigenous people and the concept of participatory mapping;
- The communal land tenure system;
- Unwillingness on the part of the government to cooperate;
- Lack of capacity on the part of the community;
- Lack of experience on the part of actors;
- Weak link between and among government institutions;
- Lack of clear demarcation for management and utilization of trans boundary resources.

Possible solutions to the challenges are:
- Raise awareness of the local community on the right they have over their intellectual properties;
- Advocate for change in the land tenure system;
- Raise awareness of the community on constitutional lobbying and other legal dealings;
- Conduct baseline survey to have an insight in to the level of their capacity;
- Organize experience sharing visits to other communities who are better off in this regard;
- Find, based on study, alternative community centred participatory sustainable development projects.

2.6 Way forward

Participants of the conference have suggested the way forward for enhanced application and utilization of community based participatory mappings under the following three major topics:

2.6.1 Awareness raising
- Participants should share the ideas they have got from this conference to others around their workplace.
- There should be intensive awareness raising work in the public specially by way of using the media.
- Empowering parliamentarians on the idea

of participatory mapping so that they act accordingly when they go back to their respective constituencies.

2.6.2 Mainstreaming

• Integrating participatory mapping approach into school curriculum and disseminating information to all stakeholders.
• Identifying simple, implementable and achievable entry point and act accordingly.
• Incorporating participatory mapping in to climate change adaptation plans of sectoral offices.
• NGOs working in areas related to environment and culture should incorporate participatory mapping in their project plan and implement it.
• Establishing participatory mapping clubs in relevant institutions.

2.6.3 Networking

• There should be networking and communication among participants of the conference to promote the value of participatory mapping to solve socio-economic problems of local communities.
• A system should be devised to strengthen the link between the youth and elders for effective transfer of traditional knowledge and promotion of useful cultural values.
• Expanding roles and responsibilities of promoting and implementing participatory mappings to all stakeholders.

2.7 Closing Remarks, by Liz Hosken, The Gaia Foundation

Liz Hosken founding Director of The Gaia Foundation, wrapped up the conference with some closing remarks. Liz said that she was happy to see people from different organizations discussing and sharing ideas for a common goal. She stated that this is a wonderful opportunity to revitalize the link between and among different institutions and the conference could be cited as a symbol of how we need to work in the future. She congratulated the organizer of the conference, MELCA, and the participants.

Liz also commended the conference for it is a forum that has given an insight into the concept of participatory mappings and eco-calendars. She said, "... we have seen that participatory community mappings and traditional eco-calendars are the best instruments for reconnecting the link between modern and traditional indigenous knowledge."

Liz said that we have to be aware of the prejudices against local community and indigenous knowledge. Best solutions to local and environment related problems are found in traditional knowledge. It is important to learn from them and help them to apply their own solutions to problems. And an ideal way to bring the community together and work with them is through preparation of participatory mappings and traditional eco-calendars. Local communities have lots of experience and the mapping forums are good to establish that experience.

Liz mentioned that Ethiopia is one of the countries rich in bio-cultural diversity and as such participatory community mappings and traditional eco-calendars can be best used to conserve this diversity. She added, "We have to promote and celebrate diversity; we find more good life in more cultural and biological diversity."

She called on all participants of the conference to promote bio-cultural diversity, traditional ecological knowledge and local experiences and the use of participatory mappings and traditional eco-calendars to that end.

Liz Hosken, The Gaia Foundation.

MELCA-Ethiopia

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Report on Trainings in Participatory 3-Dimensional Modeling

at Dinsho in Bale, Holeta in Suba-Sebeta and Masha in Sheka
January 2009 - July 2010

INTRODUCTION

The purpose of doing P3DM in Bale, Suba-Sebeta and Sheka project areas was to mobilize the knowledge of the local community for better natural resource management and to ensure the passage of this knowledge to the next generation. The models will also serve to create an environment where the local people and the local government and other stakeholders negotiate how to conserve the remaining natural resources and rehabilitate/ heal degraded areas.

While discussing the places on the maps, the stakeholders will ask: What were the places before? How were they managed? What is their status now? What do we want them to be in the future? This questioning can focus on the health of the ecosystem and the community, the governance system, the natural resource management regime and the transfer of knowledge to the next generation.

The project served as a pilot intervention and concurrently as a training ground for practitioners in Bale Zone and Finfinne Area Special Zone of Oromiya region as well as Sheka Zone of Southern Nations Nationalities and Peoples Region (SNNPR). Incorporating geo-accurate community-based mapping techniques in the planning process offers the opportunity to increase accuracy and relevance of local knowledge and stimulate increased sharing of knowledge among insiders and outsiders. Furthermore, the ownership of the management regimes resulting from the participatory plans process rest with the local communities who are responsible for their implementation. The more complete, accurate, visible and relevant

(to the users) collated information on resource distribution and use, the more effective decision-making processes for the community and their development partners.

The modeling exercises in these three project areas of MELCA were done as a result of the considerable success of P3DM in other countries, including Kenya, where mapping was used for planning, conserving wildlife, negotiating boundaries, safeguarding cultural heritage, protecting sacred sites and settling disputes. It was found to be faster than professional cartography, saving time and cost.

The mapping project in all the three areas involved more than 500 local people, including students, local youth, and community members. On the mapping process conducted in Bale trainees from Frankfurt Zoological Society, MELCA and the Bale Mountain National Park were also part of the process. In all three areas the mapping process has got huge support from the local community.

As the experience was the first to happen in Ethiopia, it was challenging to communicate to the people who have never been part of the process as to what the project needs and means.

In general, the process went extremely well and the people who have participated and local governments of the respective areas really appreciated the effort. It waits for the stakeholders to think and plan how to use the model.

OBJECTIVES OF PARTICIPATORY 3-DIMENSIONAL MODELLING (P3DM)

Long term objectives

- To help use the model for developing a watershed management plan for better natural resource management of Dinsho and Welmera woredas in Oromia and Masha Wereda in SNNPR.

- To help the local government and stakeholders in the three woredas use the models for water shade and natural resource management planning

- To use the model for learning among communities and use the experience for creating a common vision.

Immediate objectives

- To train stakeholders in Participatory 3 Dimensional Modelling
- To model an area of land belonging to the community and hand over the model to the local actors to help in planning and education
- To create a sense of vision in the local stakeholders concerning environmental protection and natural resource conservation.

PROJECT IMPLEMENTATION

The project was implemented through the following phases:
i. Preparation
ii. Modeling / Community Mapping
iii. Handing over

Phase 1 - Preparatory Phase

This phase lasted three months for each P3DM process. Activities undertaken included (i) identification of the area (ii) sourcing spatial data and preparing the base map, (iii) choosing the appropriate mapping scales (vertical and

horizontal) (iv) procuring workshop materials, (v) consulting and Mobilizing students and stakeholders, selecting trainees and (vi) organizing the logistics.

(i) Identification of Project Area

For the modeling in Bale the Dinsho Wereda, which houses the headquarters of the Bale Mountain National Park, was selected for the modeling. This was done in consultation with FZS and SoS Sahel and Farm Africa. In a similar manner, in Finfinne Area special Zone of Oromia, the Welmera woreda, and in Sheka zone of SNNPR the Masha woreda, which are the center of projects in the respective areas were selected for the modeling.

For the mapping exercises at all the three sites the scope was decided to be at the Wereda level to help Wereda level planning and implementation. The choice for the Wechecha mountain meant that both the Welmera and others are included. Yet, some areas of other Weredas were also included in all the three models. This is basically because the models assume a rectangular shape. The scope of the model of the Suba-Sebeta is still some how wider, incorporating two woredas, Welmera and Sebeta Awas as the main focuses. This scope was determined because for the model to be used as a basic tool for the initiatives working for the rehabilitation of Wechecha and Addis Ababa Mountain Ranges. The scope also covers our project site.

(ii) Sourcing of Data and Preparation of the Base Map

Preparation of the base map featuring color-coded contours has been the responsibility of the Consultant. This proved to be a frustrating process for Bale because of the lack of experience in doing similar activities. It was not that difficult for the other project areas.

The topographic sheets from which contour digital data were derived were readily available at the Ethiopian Mapping Agency. The terrestrial

contour intervals were 20-m ranging between 2380 - 4120 m elevation in Bale, 2880-3310 in Sebeta Suba and 1300-2700 in Masha. This process involved scanning of the hardcopy using an A0 scanner, geo-referencing the digital image and digitizing the contour layers.

A horizontal scale of 1:12,500, 1:10,000 and 1:10,000 is used for the modeling at Dinsho, Suba-Sebeta and Masha respectively. The scale used at Dinsho is relatively smaller to include the woreda. As such an elder, who participated on the process, commented "you know we could have put a lot of information on the model if it was a bit bigger". Taking this as a lesson, the scales for the later experiences were somehow improved.

The model at Dinsho measures 320-cm x 280-cm and has been constructed using three base tables each measuring 280-cm in length and 120-cm in width, while the later two models measure 280-cm x 240-cm and have been constructed using two base tables each measuring 280-cm in length and 120-cm in width. The height of all the tables was 60-cm.

(iii)   Procurement of workshop inputs and their on-site delivery

The success of any Participatory 3D Modeling exercise heavily depends on the availability of all necessary inputs at the location where the event will take place. We could find most of the necessary materials from Merkato and a few from small towns in the respective areas except the crepe papers and colored pins. The pins and crepe papers were sent from Netherlands through the courtesy of Mr. Giacomo Rambaldi.

The materials were ordered according to specifications listed in the handbook "Participatory 3-Dimensional Modeling: Guiding Principles and Applications" and in consultation with CTA.

An updated supply list is available on the Internet at http://www.iapad.org/supplies/items.html.

(iv)   Consulting and Mobilizing Students and Stakeholders

Representatives from 24 kebeles in Bale, 37 kebeles in Sebeta-Suba (22 rural and 15 urban kebeles), and 25 kebeles in Sheka, 3-5 person from each kebele, including traditional leaders, elders, and farmers, men and women, and youth attended the mapping exercise and contributed to the collation of the knowledge base which formed the basis for depicting resource distribution and use of the 3D model.

In order to properly mobilize the villagers, a team of the staff of MELCA visited each village to meet with the heads of the kebele and other community members. In each village the team introduced the planned workshops (mapping and planning), the importance of village involvement and selection of representatives and benefits deriving from villagers' participation.

(v)   Selection of trainees

Selection of trainees at all the sites was done principally in consultation with schools and local government administrators; FZS and SOS Sahel aparticipated in the selection done in Bale.

MELCA coordinated most of the selection and the mobilization of local community. Students from primary and secondary schools in the respective areas and local youth groups participated.

Local authorities in Dinsho, Sebeta-Suba and Masha were also briefed about 3D modeling exercise and its significance in effective land use planning and natural resource conservation.

(vi)   Preparation of the draft legend

While students and the youth were working on the construction of the map a draft legend was prepared through the consultation of two elders from among members of the respective communities. The community added and elaborated the draft legend at a later stage.

Prioritizing and getting consensus among mapmakers on which items are relevant and what should be featured on a map is the first step in a participatory process aimed at addressing community-based issues related to the territory and its resources.

It is worthwhile noting that all trainees acted as co-facilitators and went through all roles necessary for learning good facilitation practice.

Phase II - Community mapping phase

The preparatory phase was followed by the community mapping phase. All activities under this phase were carried out at the secondary schools of the respective project areas. It involved the following key activities:

(i) Introducing and orienting trainees on facilitation techniques and participatory 3D modeling

This was a critical process as it is crucial that the trainees should understand the concept of participation and what the purpose of the modeling is.

Participants were given an introduction on the origin and historical development of 3D modeling and their role in the process. They were also given an introduction on the stages of the model building, and that the process facilitators are there at their disposal whenever they have anything to ask.

(ii) Assembling the blank model

Selected students and local youth are the dominant participants during the assembling process. Some elders have also participated even at this stage. It was an exhaustive process, but the youth, at all the three sites, worked at it courageously.

The youth have easily mastered the techniques of cutting and preparing at the right size, tracing, cutting and building the model by piling the cardboards. It was fascinating to watch how the whole landscape shapes itself as each cardboard comes and rests on top of the others. This process took 3-4 days depending on the rate at which students and youth at each of the project sites comprehended the idea and acted accordingly.

(iii) Drafting and fine-tuning the map legend

As mentioned draft legends were prepared in consultation with two elders while the students and youth were building the blank model. The two elders identified points, lines and polygons that would appear on the model.

After assembling of the model is finished, elders came to populate the first model. The elders who participated on drafting the preliminary legend explained what they did to the rest of the community members. The community members made necessary changes to the draft legend and came up with the final version of the legends. For instance, in the practice in Bale, in the draft legend, green pins for church and white for Mosque. Later an elder commented that both should be white as both are places of peace. This was done so.

(iv) Transposing cognitive maps

The local community used pins, lines and polygons to populate the models with the spatial knowledge they have about their respective areas. They have identified sacred sites, water points, rivers, forestlands, agricultural lands, roads, lanes, mineral waters, etc.

(v) Transferring data from topo map to the 3D model

Some information was transferred from the topo map to the 3D Model. This includes roads, big rivers and mountain peaks. But sometimes it happens that the information on the topo map does not coincide with the knowledge of the community members and the reality on the ground. On the exercise conducted in Bale, for instance, it was found out that a mountain peak called Shawiso was wrongly put on the map. It

created a lot of confusion but the community made the correction.

(vi)   Extracting data using digital photography

Photographs of the finished model were taken. This was achieved by tilting the models perpendicularly and taking the photos with Nikon 90D camera from a distance of 4 metres.

Phase III – Inauguration and Handing over of the Models

After completion the models were handed over to the respective local governments in the presence of local community, representatives of government at zonal level, representatives of non-governmental partner organizations and MELCA staff. On each ooccasion slide shows, which showed the process of building the model, were presented. The local community explained to the participants the points and features on the map. The participants commented how impressed they were by the power of the model to show how knowledgeable the communities are and the challenge that both the government and the community face to conserve their environment.

Participatory 3-Dimensional mapping, Ethiopia

Mapping exercise summary fact sheet 1: Bale

Organizing Institutions	MELCA-Ethiopia
Funding Partners	Frankfurt Zoological society and SOS Sahel and Farm Africa
Venue	Dinsho High School
Dates	January 10 to February 15
Duration of the actual P3DM exercise	One month
Duration of preparatory work	Three Months
Participants	
1. Villagers	Dinsho, Sinana, Goba, Agarfa and Adaba Wereda elders
2. Trainees from various institutions:	FZS, Bale Mountain National Park and MELCA staff
3. Students and teachers	From Dinsho elementary and secondary schools
4. Resource person	Million Belay - facilitator Zeleke Kibebew and Henok Eyob - GIS advisors
The Model	
Horizontal scale	1:12,500
Vertical exaggeration	3x
Elevation contour interval	20
Highest elevation on the model	4120
Final size of the model	320 cm x 280 cm
Area covered	1575 sq km or 157500 hectare
Geographical Coverage of the exercise	
Region	Oromia
Zone	Bale and West Arsi Zone
Weredas	Dinsho, Sinana, Goba, Agarfa and Adaba

Mapping exercise summary fact sheet 2: Suba-Sebeta

Organizing Institutions	MELCA-Ethiopia
Funding Partners	Horn of Africa Regional Environmental Centre/ Network
Venue	Holeta town, Welmera Peasants Association Hall
Dates	July 4-18/2009
Duration of the actual P3DM exercise	Two weeks
Duration of preparatory work	Four Months
Participants	
1. Villagers	Welmera, Sebeta Awas and Sululta Weredas and Burayu and Sebeta town administrations and periphery of Addis Ababa elders
2. Trainees from various institutions:	YSND, Endurance Youth Association and Suba-Sebeta Forest Organization
3. Students and teachers	From Holeta town 5 elementary and secondary schools and Holetegna Berfeta Youth Nature Club
4. Resource person	Million Belay – facilitator
5. GIS specialist	Henok Eyob
6. Task managers	Shimelis Tegenge Endale Sahilu Million Belay
The Model	
Horizontal scale	1:10,000
Vertical exaggeration	2x
Elevation contour interval	20
Highest elevation on the model	3310
Lowest elevation on the model	2880
Final size of the model	280 cm x 240 cm
Area covered	672 sq km or 67200 hectare
Geographical Coverage of the exercise	
Region	Oromia
Zone	Finfinne Area Special zone
Weredas and Town Administrations	Sebeta Awas, Welmera and Sululta woredas and Holeta and Burayu

Mapping exercise summary fact sheet 3: Sheka

Organizing Institutions	MELCA-Ethiopia
Funding Partners	
Venue	Masha High School
Dates	July 10-24, 2010
Duration of the actual P3DM exercise	Two weeks
Duration of preparatory work	Three Months
Participants	
1. Villagers	Masha and Anderacha Wereda elders
2. Students and teachers	From Masha elementary and secondary schools
3. Resource person	Million Belay - facilitator
The Model	
Horizontal scale	1:10,000
Vertical exaggeration	2x
Elevation contour interval	20
Highest elevation on the model	3500
Final size of the model	280 cm x 240 cm
Area covered	672 sq km or 67200 hectare
Geographical Coverage of the exercise	
Region	SNNPR
Zone	Sheka zone
Weredas	Masha and Anderacha

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