Participatory Community Mapping and Land Use Planning through 3D-modelling

6 – 16th May, 2003

Tura and Sasatgre, Meghalaya, India

ICIMOD

PHILIPPINE ASSOCIATION FOR INTERCULTURAL DEVELOPMENT, INC.

NERCRMS
NORTHEAST REAGION COMMUNITY RESOURCE MANAGEMENT SOCIETY

EXECUTIVE SUMMARY

The Participatory Community Mapping and Resource Management Planning Using 3D-Modeling training was done in three stages starting with a 2-day session at the Circuit house in Tura starting with a basic orientation and the theoretical basis of community mapping methodologies. The initial session also included instructions on map reading, a background on basic Geographic Information System (GIS), Global Positioning System (GPS) instrumentation and hands-on computer training on the production of base maps for 3D-modelling.

The hands-on training and field testing phase of the activity was conducted in the village of Sasatgre, West Garo Hills. A 1:5000 scale 3D-model of the Sasatgre Akhing, was constructed in the with the participation of community members NARM Group members, the local Nokma as well as the Nokma's of adjoining villages beside Sasatgre.

An actual field traverse was also undertaken to further hone the skills of the participants in the handling of the GPS. This also provided the villagers as well as the project staff with the opportunity to locate the geographic positions of important landmarks which were used as geo-referencing positions for the 3D-model.

The traverse included field trips to villages outside Sasatgre to locate important positions such as the boundary of the newest jhum and the permanent forest line demarcating the reserved forest near Nokrek peak. The position of the eye of Simsang river near the Nokrek peak was also taken via GPS by the training participants .

A two-day refresher on base map production and GPS operation was conducted at the tail end of the training. Selected participants mainly coming from the West Garo Hills district were once more given instructions and hands-on training at the project office to further reinforce their previous learnings.

Over-all participation among the project staff and trainees was exemplary throughout the duration of the training. The activity was evaluated by the participants and was rated at a very satisfactory over-all grade of 4.14 pts. in a scale of 0-5.

The participants of the training were composed of the following: 31 from the NERCRP project districts and other District Offices. From Sasatgre, 18 participants representing the Women, NARM Group, and traditional leaders regularly attended and participated in the deliberations and discussions during the activity.

I. INTRODUCTION

The training was conducted as a result of an earlier mission conducted by the ICIMOD and NERCRMP to determine the appropriateness and viability of conducting a training on Participatory mapping and resource mgt. methodologies. The mission engaged the services of a consultant Mr. Dave De Vera from the PAFID an NGO which provides training on P3DM.

The following are the main objectives of the training:

It is expected that after the training, the project staff as well as selected community members shall be able to identify the extents of their management areas, produce base maps, construct and assemble 3D-models of selected communities within the park. Furthermore, they shall be able to transpose critical data and information regarding size, location and limits of land uses and tenurial arrangements including the location of important geographical features that define their territories. Such data and information shall be geo-referenced and scaled and consolidated into a higher level of acceptable technical efficiency and accuracy.

The training shall also provide a broader perspective of the potential uses of the 3D-Modeling methodology as well as basic analysis tools of the data and information generated from the model. This shall range from simple manual measurements to the integration and digitalization of data into Geographic Information System (GIS). This will include discussions on basic hardware/software required and its uses.

A. Opening Session

The training was formally opened with a brief ceremony graced by the NERCRMP Adviser, Dr. Drupad Choudhury; ICIMOD Project Officer, CM. Anil; NERCRMP Project Manager, Daniel Enting; Training Coordinator Mr. Dave De Vera of the PAFID, and Hon. Shyam Jagannathan Deputy District Commissioner, West Garo Hills Autonomous District Council

Message of the Deputy District Commissioner, West Garo Hills Autonomous District Council

In his message the Deputy District Commissioner expressed his appreciation for the conduct of the training and informed the groups that, the District Society welcomed the opportunity provided by the project to further enhance the capacity of project staff and District officers to work with communities learn to develop new tools for participatory resource management planning. Deputy Commissioner Jagannathan further cited the following important points for consideration of the training organizers and participants.

- Data on Land Resources and Land Use including the manner in which it is recorded, collected and shared is under the sole purview of the Autonomous District Council; District Council.

- Micro-planning
  Government of India initiatives are implemented using benchmarks. There are regional disparities that sufficiently depart from these benchmarks. District-level planning, such as connectivity by road in terms of no. of houses, is crucial.;

- Macro-planning
  WGHCRMS's approach is bottoms-up: grassroots-level planning, demand-driven and provides critical bridges so that the community has the confidence to approach the District Government as an institution, to demand services. The adequate amount of communication, and then accountability is just not there (security, insurgency).

- Community Empowerment
  Expect social empowerment in this undertaking, the development of social groups to a degree that they demand services, and hold the Government accountable. Communities should be enable to demand accountability from state/Government workers and officials.

B. Orientation and Leveling of Expectations

At the onset of the training, a leveling of expectations between the participants, organizers and training team was facilitated by Mr. Dave De Vera. This was done to check the appropriateness of the training design, ensure the timeliness of the schedule and the acceptability of the training methods.

Participants Expectations :

- Learn how to use 3D models in land-use mapping, to manage available resources and use them in a sustainable manner

- Community self-empowerment process, control of their resources, gradually empower themselves

- To end up with a relief model of the whole district: to know what we have, what we have developed, preserve the catchments areas for water resources and the migration areas for wildlife, to know what will happen otherwise (if we don't take care of it, what will happen)

- Link mapping technologies to livelihood, or relate it to livelihood, production

- Use it for the management process for a single village, and then draw out common watershed practices for contiguous villages (can this be done?)

- How do we locate what I see before me (on the ground)

- How do I know what the resources are just by glancing at a 3D model?

Majority of the expectations were consistent with the objectives and goals of the training thus ensuring its relevance and applicability to the local conditions of the participants.

II. TRAINING PROPER

A. Participatory Mapping Methodologies: Orientation and Background

A lecture on the background on Participatory mapping g methodologies was delivered by Mr. Dave De Vera. His lecture provided information on the various mapping methodologies that are available, their differences, adaptability ad appropriateness of the technologies involved.

B. Map Reading: Understanding and Reading maps

The afternoon session was devoted to the understanding and proper reading of maps. The main lecturer for the session, Engr. Randy Abeto focused on Maps and its Nomenclature and basic Map reading using Topographic maps with gridlines.

An in-depth discussion on the parts and uses of a map was given along with a show and tell session where the participants were divided into workshop groups and collectively solve the map reading exercises that were provided by the trainers.

C. Introduction to 3D-Modelling

The 3D-modelling technology was introduced to the trainees by Mr. De Vera in the in the morning session of the 2nd day. His lecture included the history of 3-D Modelling and its uses in various arena and fields. The rationale behind the utilization of the methodology as a participatory planning tool was also shared. The session was also the time to introduce the basic steps of 3D-modelling its preparation, assembly and the transposition of data to the model.

Upon familiarizing the training participants with the 3D-model, Mr. de Vera presented the various processes and methodologies used in extracting data using GPS, sketch maps, and 3D-models. The session included a discussion on data analysis tools than can be utilized to generate data from the 3D-model, thematic layering for land-use determining the movement of resources through time, and selecting features such as polygons, points and lines to calculate area, distance, position and frequency.

D. Introduction to GPS: Instrumentation and Basic Operation

Ms. Kail Zingapan was the lead trainer for the afternoon session. She was responsible for the two main topics of the PM session these were, 1) GPS orientation and Basic instrumentation Training, and 2) An Introduction to GIS: Spatial Data digitalization, Data Management and Projection.

The lecture provide an overview of the Global Positioning

System (GPS); the referencing system the equipment uses, the main components of the system and the data capture and post processing process. The GIS introductory session stated at the latter part of the afternoon. The process of integrating data generated from the mapping methodologies that were discussed in the earlier sessions into a GIS, was the focus of Ms. Zingapan's lecture.

E.   Digital Data Management

An overview of the basic steps in converting data into digit al for m was provided to the trainees with emphasis on the type of hardware that is locally availa ble to the district project offices. The lecture included an orientation on data management and the conversion of filed data into basic polygons, lines and positions that are later on used as the building blocks of a basic digitally created map.

F.   Base Map Production

The session extended early into the evening where further lecture and instruction on the production of base maps for the 3D-model was discussed. In this part of the training, the extents of the management area of the target village (Sasatgre) was identified from the topographic maps. The identified area was scanned and by using a simple photographic enhancement software, the participants stitched and enlarged the scanned contour images into the appropriate scale (1:5,000). A the end of the whole day session the participants were able to produce their 1st base map of the village of Sasatgre.

G.   Geo-referencing and GPS field testing

Starting on the 3rd day of the training, the venue shifted to the village of Sasatgre where the actual construction f the 3D-model was conducted. A short session attended by the village elders was held to introduce the participants, discuss the schedule and orient all concerned with the mechanics of the whole activity which was expected to last for the next 6 days.

Workshop groups were formed by the training participants along with the selected village representatives. The groups collectively discussed and identified the significant and important geographical features that shall be located and used as identifying markers of the 3D-model. Facilitators and translators were assigned for each workshop group. The results of the discussions of the two workshops are as follows:

The women's group selects important landmarks for their community map. They chose the stream which feeds drinking water to Sasatgre song, Sasatbol Chiring.

Also other landmarks that appear to have cultural significance, like Rongma Dangdang, which a large boulder which is thought to have settled to its present position possibly moved on its own. The group also prioritized community features such as the playground, school house and some important structures.

After some spirited discussions, the group composed of the men agreed to locate the geographic position of at least 15 landmarks. These included markers with cultural significance such as the traditional long house of a community member who has not been Christianized, permanent geographical features such as the Rongma Dangdang (a large boulder), and the waterfalls. The men's group also decided to map the location of more current geographical features like the playground and the schoolhouse.

It is very noteworthy that both the mothers/women's and the men's group selected almost the same landmarks. This consistency among the two groups is very crucial in ensuring the acceptability of the resulting map as it shall show geographical markers and features which are important to main interest groups n the community.

After a traverse plan was established by both groups, trainers were assigned and an actual field traverse was conducted. Raw data was gathered using the line, point and area features of the GPS. Early in the evening, the participants were taught how to download field data the computer and the raw output was shown to both the trainees and the community members.

Data gathering and identification of community landmarks would proceed till the following morning as some points and features can no longer be located and reached due t darkness and the proximity of the location of these landmarks.

H. 3D Construction

The 3D-modelling phase of the training started on the 4th day of the training with a lecture delivered by Engr. Niko Caslangan. The participants both from the project and the community were given an overview of the basic steps and procedure of constructing a relief model. The geographical landmarks earlier mapped with t he GPS were all located by the partic ipants in the topographic sheets. This exercise familiarized and oriented the participants with the base maps.

Work groups were formed and the various tasks required in the construction of a 3D-model were distributed to the work-groups.

Upon completion of the 3D-model, a community meeting was facilitated by the project staff along with their NGO counterparts. The meetings was held to identify and set the boundary of Sasatgre in the 3D model, Nokmas from the adjoining villages came to the training and had a discussion.

The Nokmas from Mandalgiri, Dura Kalatgiri and Chandigiri came. Only the Nokma of Rombagiri, with whom they have a boundary disagreement, did not attend.

I. Results/Feedback of Nokma's meeting

- Other Nokmas said that the model will be useful. They can identify their boundaries very easily from the model, and can refer to it from time to time.

- We can identify the boundary points easily.

- We can identify the catchments areas for the streams. Looking at the model, we know where all the streams are and we can lay out the pipeline. We can find out if the catchments area is higher.

- Can we use the 3D to find the head? (Answer: Yes, if used with the SOI topographic maps)

- The 3D model also shows where the flat lands are that could be possibly developed as terraces.

- Catchments areas are 50 meters from the streams.

- Sasatgre Nokma plans to invite Robagiri Nokma to the village to see the 3D model to discuss their problem.

- Mandalgiri has a close, kinship-based alliance with Sasatgre.

J. Coding the information in the 3D-model

With the extents of the Akhing formally marked by the Nokma, the community participants proceeded the identify the various land-uses within the village of Sasatgre. Fourteen color-codes were used by the community to define the various land-uses within their village. These include the following:

Legend: Garo, English

- NOKRANG – households
- SKUL NOK – school building
- GILJA NOK – church
- SIMA – boundary
- SOROK – road
- RAMA – foot path
- CHIRING – stream
- CHIBIMA – river
- ABA ONAGIPA BURING – jhum fallow

- ABA CHAGIPA – jhum
- KOMILA BAGAN – orange plantation
- APAL – wet terraces
- REJAP, REJAP CHIRING – watershed, stream catchment
- RIPINGE DONGIMIN BURUNG – reserved forest
- MATCHU CHA AMRAM – grazing land, pasture land
- ROONG PATAL – big flat rock
- SONG – village
- GOPRAM – graveyard
- ROBOL KALRAM – playground

The turnout in the community participation in the color-coding of the land uses was heavy. Separate sessions were held for the Nokma, the NARM Group and the women. The extents of each land use were initially drawn using light paint, chalk or pencil pending its validation by the other participants representing the various interest groups in the village. Only upon reaching a consensus were the defined land-uses were permanently marked with the assigned color.

IV. EVALUATION AND FEEDBACK

At the culmination of the whole 3D-training at the village , an evaluation and feedback session was conducted for all the training participants as well as for the community. This was facilitated by Ms. Zingapan with the assistance of Mr. Perry Marak and Gary Sangma.

During the evaluation the participants were grouped according to the areas which they came from and asked to rate the training using a simple tool to which provided a performance and acceptability rating scale. Representatives of each group presented their findings before the group as well as heir general feedback and simple re-entry plans.

Sasatgre and Sakaladuma songs *(NARM and livelihood groups):*
translation by Gary and Perry

- Now that we have completed this 3D model, we can see the boundaries of our Akhing land, which we have never seen before.

- Because of the 3D model, we can resolve disputes in cases of boundary conflicts.
- We can see very clearly which part of the Akhing land has the forest, and which part is used for jhuming.

- The 3D model will help outsiders to find where our homesteads are. Whenever outsiders come to our village, it will be easy to show or locate the landmarks, such as the Nokma's house.

- I believe this is the most useful learning for our community as a whole. We can identify very easily how many streams and water sources there are in the Akhing land, and easily identify areas to source drinking water.

- It is now easy to show outsiders where the caves, waterfalls, sacred groves and other important areas of the Akhing land are.

- Now we can identify where the wild elephants used to cross, and where they stayed.

- We planned to complete the model in 6-7 days, but it only took us a day.

- When we plan for jhuming next year, we don't need to go to the actual sites to portion the homesteads. We will come to the 3D and sit around it to decide which part of the Akhing land will we use for our jhuming.

- We are very, very happy to meet people from the Philippines, Bangladesh and other places that are far away. It is an opportunity for use to see their faces, what they eat, how they are. The trainers from the Philippines are from a foreign country, are highly educated, but they think like local people, eat like us, talk to us and laugh with us.

- The community would like to extend all assistance for this activity.

Mothers' Group:

- It is easier for us to know about and fine the streams of the Akhing land and we are happy for that.

- We can easily identify or locate where are our jhums, what we have used.

- It is easy for us to identify the wet terraces (apal) and how big they are.

- We can identify the rivers and preserve these rivers. Also, we can easily identify where we are, and where we can make our orchards and wet terraces.

- Now it's not only the parents who know what is inside the Akhing land. We can show our children, and teach them what is inside the Akhing land by showing them the 3D model.

- We can tell our children what the boundary of the Akhing land is, teach them what areas are for orchards and apal, and other uses, so that they will know how to preserve the streams and the forest.

- If necessary we easily identify areas where we can plant firewood species to use for each household.

- I am the secretary of this self-help group, but we cannot give you the sort of help we are supposed to give you (season for burning and preparing jhums before the rains fall). But you have completed this model for us. This means that you really care for us. We are sorry we were not able to do more (she was busy in the fields; when it was her turn to help, the 3D model was already completed).

ex-Secretary of the NARM group in Sasatgre, comments:

- Now we see our Akhing land very clearly, the streams, which we could not see like this before. It is easy now to locate the streams and the rivers, and what land could be used for wet terraces.

- Even older people now can understand this, what is inside the Akhing land.

- After finishing the 3D model, it easy to see where the rivers are. It is easy to explain to the young people what the rules and regulations are for the rivers, to explain what should not be done in the forest. For this we are very thankful to the modelers. Thanks to the trainers from the Philippines. A very special thanks to IFAD for this 3D model. This would not have been done without them.

Sasatgre Nokma, comments:

- I am glad to see this 3D model. Through this, different people from different countries have lived with us in our village.

- This 3D model will be very useful to use. We can see the boundaries of the Akhing land which we have not seen like this before.

- There are 48 houses in this Akhing land. All people in this village are poor. But even if we are all poor, we must do things to change our economic system.

- We use the 3D model to make a plan for different parts of our Akhing land. This 3D model is not just for the elders but for our grandchildren as well.

- We can easily identify where the caves lie, the waterfalls.

- When I distribute the plots to the different families, there will be no confusion where the plots are, and how much area each family will occupy. We don't need to go to the jhum fields when we distribute the plots. We can sit around the 3D.

- It is because of this 3D that we can understand what is inside our Akhing land, and to show other people. All the places are in front of us, we can see everything, even small children. We can bring the children to the 3D model so they can understand.

- We are very happy. For this to happen is not something we did by ourselves, but fate and the Almighty has brought these people here.

NGOs:

- Apang, Ukrul: I can use this 3D model to explain to our partner villages more clearly about resources mapping, social mapping.

- Charsing, Sasatgre: I feel very privileged because we have finished a 3D model in my village. People have already started identify their jhums, and the participation from the people was very good. Thanks to our experts – they explained in such a way that we can understand very clearly. Since the 3D model is finished in Sasatgre, it is now easy to plan and managed the streams, the land, the resources. There is a bright future for us.

Bangladesh:

- The training was interesting, but we have difficulty in understanding the local context (Tura).

- Tracing the contours properly when there is a big crowd building the 3D model requires care and coordination.

- We really enjoyed the villagers' company! The set-up – the food, music, and dancing – was excellent!

- We have very little background in GPS and GIS so the exercises and lectures were really fast for us. We need a longer time to understand these portions.

- We had enough opportunity to participate in the practicum.

- The Sasatgre community was really engrossed with the activity, even if 3D modeling was difficult to do.

Meghalaya Districts:

- The 3D model is really useful. The villagers have already started planning using the 3D model beginning yesterday!

- The availability of the materials was a constraint.

- It was difficult for some to participate. There were less computers and GPS receivers than was needed in the training. Batteries were also a problem.

- The food was excellent! Participants mill around the kitchen because the food was great.

- The villagers were active in participating in the 3D modeling exercise. The women were hesitant in the beginning, but when the 3D model started to rise and they saw the modelers were tracing a small Sasatgre, the women began to participate.

Districts in Other North East States:

- The 3D model is very useful and very helpful for our work. The lectures are very good and use simple language
- The lectures were very good and used simple language. We didn't have enough opportunities to participate in the exercises.

- The materials required were not there, and because of the time constraint (procuring the materials), we were not very accurate in making the 3D model.

Dr. Dhrupad Choudhury

- Since we have to improve the local economy, we have to plan so that everyone has a wet terrace. Some might want to plant other crops later on, such as tea, bay leaves, grass for broomsticks – a livelihood that is forestry-based.

- To do all this, Sasatgre can use this 3D model for planning: plan to conserve the water and have a catchment forest.

- Very easily have make annual plants: to sit together around the 3D (this is the new phrase in Sasatgre, to sit around the 3D, which means to plan and talk about the Akhing).

- You can use the model to lay out the drinking water pipes properly.

- Planning took us years in the past. Now it will take a lot lesser time to plan. I hope this help your song.

- This is a humble gift for the future, and for the children.

Borbashemphang, East Khasi Hills:

- Since the planning needs to come from the village, this tool is very important.

- This kind of tool is very important if the village plan is going to be used as the bases for NRM planning. Thank to our trainers from the Philippines. We have very good teachers! Dave is very good.

- I will talk to our Project Management, and the communities about the exercise.

- It takes us 3-4 days to plan since there are lots of conflicts with the forest reserve, boundary conflicts, and so on. Having this kind of tool will help.

Atul, Assam:

- This will be helpful to the villagers when they are jhuming. Instead of going around, they can gather around the 3D and plan their activities.

- They can past it on to their children. It will last 30-40 years.

Deputy DC, West Garo Hills:

- There is good chemistry between the teachers and the taught.

- This will be a chain reaction from our Society's cluster. We are doubly blessed because Sasatgre already has a 3D model.

- We will duplicate this our other clusters.

Results of the participants evaluation workshop

Evaluation Tool: Range of 0-5

Group	Lectures & Exercises	Practicum	3D Model Use & Analysis	Participation	*Food & Logistics*
Bangladesh	3	4	4	4	*5*
Meghalaya Districts	4	5	4.5	3.5	*4.5*
Other North East Districts	4	4	5	4	*4*
Average: 4.14	*3.6*	*4.3*	*4.5*	*3.8*	*4.5*

V. FINDINGS/RECOMMENDATIONS

- The conduct of the Participatory Mapping and Resource Management Training using 3D-Modelling, was a relative success due to several important factors that contributed to its conceptualization, development and implementation.

  ✔ The confidence building measures instituted by project management prior to the engagement set the stage for the acceptance of the activity and its adoption both from the concerned community as well as the important institutions such as the NGOs, the District Council and the other Governmental agencies.

  ✔ The process of consulting, discussing, understanding and prioritizing the needs and requirements of the community as well as the project staff provided the very important backbone to the initiative as it was able to i) address the capacity building needs of the project staff; ii) respond to the need to define their own spatial resource data for the community; iii) take into account and inform the Governmental institutions of their role; iv) develop potential multi-stakeholder partnerships in the field of planning; and v) accomplish the data generation objectives of the project.

  ✔ The experience and skills of the participants in the training contributed greatly to the accomplishment of the objectives of the training. Most of their expectations correlated directly to the actual content of the training design, thus ensuring its relevance to the participants. However, some frustration was experienced by the Bangladeshi delegation as their local experience in issues such as Land Tenure, Resource Management and Data generation were not in the same breadth as that of the majority of the training participants. To this end, certain adjustments were made to accommodate their needs, however this could only minimally mitigate the problem. What is needed is a separate training for the

Bangladeshi group so that the whole context of the activity could be specifically designed to fit their own local development context.

- Participation among the community members proved to be a high point of the training. Credit should be given to the project management and staff as well as the NGO counterparts who provided excellent facilitation and translation services which ensured the maximum participation of the local people.

- In certain portions of the training, participation suffered due to limitations in logistics and materials. This could be remedied in the future with a combination of better planning for material procurement and the determination of an optimal number of participants invited to attend.

- Further discussions among the project staff and the community should be encouraged to develop other analytical tools and uses of the 3D-model. Current usage is limited to area and distance measurements of village extents/boundaries as well as land/resource uses. Prior to the expansion and introduction of the methodology to other communities, it is highly recommended that other analytical uses of the model be studied and tested along with community leaders to broaden and increase the utility and relevance of the 3D-model as a planning tool.

- The project management and staff of the various districts should agree on a common measurement, scale and type of materials used in the construction of 3D-models. This shall ensure the critical consistency required especially in dealing with villages with shared and contiguous boundaries. Furthermore, uniformity in measurement units shall make discussions among the staff and communities more coherent and efficient.

- The project staff could exercise bulk-buying of materials. This will enable the staff to purchase materials at a discounted wholesale price and at the same time ensure uniformity of materials and regular and timely supply when needed. To this end, the project staff are also encouraged to try and explore other materials that are cheap and locally available. It is only through continuous experimentation that the most appropriate materials in terms of quality, durability, availability and price will be determined.

- A point person in Participatory/Community Mapping should be identified by the project management. That person/s shall be responsible for the coordination of all mapping activities and shall ensure consistency and regularity in terms design, logistics, materials and measurements. This can already be easily addressed by the project since there several highly skilled and qualified personnel like Mr. Perry Marak and Senti Jamir respectively.

- As the project proceeds with further 3D-mapping exercises in other villages within the project coverage, it is expected that the volume and complexity of spatial data gathered by the project shall also increase. To address this potential issue, it is recommended that a Data Analyst be trained from among the current staff of the project. This person shall be primarily responsible in the collection and consolidation and management of data gathered from mapping activities. A secondary task would be the digital production of Base Maps and basic digital encoding of data in a simple data base.

- During the progress of the training several project officers/personnel exhibited a high potential for this important task. Perry Marak once more showed promise for this task, moreoevr Ms. Sangita Roy not only showed very high interest but also fluency in information technology

which allowed her to easily grasp the skills required for the task. Its is highly recommend that the project take advantage of these skills that are available for utilization. Further training for these personnel shall easily enhance and improve their skills which shall be crucial once the project decides to move on and tackle more complex and varied spatial data.

Annexes

List of Participants
NERCRMP Districts

ID	Name	District	Sex	Designation	Organization or Office	Address
1	Bhuyan, Putul	Karbi Anglong	M	NRM Organizer	Karbi Anglong CRMS	Hamren, Assam
2	Chakma, Arun Kanti	Chittagong Hill Tract	M	Executive Director	Assistance for the Livelihood of the Origins	Pankhaiyapara, Khagrachari, Bangladesh
3	Chakma, Hari Kishore	Chittagong Hill Tract	M	Secretary	TAUNGYA, an organization for indigenous culture, environment, and socio-economic advancement	Rajbari Road, Rangamati Hill District 4500 Bangladesh
4	Chakraborty, Sanat K.	East Khasi Hills	M	Journalist	Grassroots Options	Lower Lachumiere, Shillong 793001
5	Chakravarty, Atul	Senapati	M	Project Technical Officer	SEDCORMS, IFAD	Senapati 795106, Manipur; Residence: Village Barpara, P.O. & District: Bong Aigaon, 783380, Assam
6	Dewan, Jatan Kumar	Chittagong Hill Tract	M	Program Director	Green Hill	Bararupa, Rangamati, Bangladesh
7	Dili, Kai Terang	Gauhatty, Assam	M	Community Organizer	Bosco Reachout	Village: Chephung Sajir. P.O. Diphu 782460, District: Karbi Anglong, Assam
8	Hmar, Mary	N C Hills	F	NRM Organizer	NCHCRMS	
9	Jamir, Senti	N C Hills	M	Project Technical Officer	NCHCRMS	
10	Kuba, Matthias	West Garo Hills	M	NRM Organizer	SEDCORMS	Senapati, Manipur; Residence: Maram Bazar, Senapati 795106, Manipur, India
11	Kumar, Mithlesh	West Garo Hills	M	ICAR	KVK	Sangsanggiri, Tura
12	Lapang, Hunlang Kitbok	East Khasi Hills	M	Project Technical Officer	KCRMS, Nongstoin, West Khasi Hills P.O. & Village Bhoirymbong via Umiamkhwan 793103 India	Nongstoin, West Khasi Hills
13	Lopez, Sr. Rosario	West Garo Hills	F	President	Bethany Society	Arai Mile, New Tura 794101 Chandmaru, Tura
14	Marak, Charseng D.	West Garo Hills	M	S.O.	AWS KRIMA IV	Chandmaru, Tura
15	Marak, Perry R.	West Garo Hills	M	NRM Organizer	WGHCRMS	Tura
16	Prasad, Sitaram	West Garo Hills	M	M&GA		
17	Roy, Sangita	West Garo HIlls	F	P.F.	WGHCRMS	Akhonggiri, Tura 794001 P.B. No. 18
18	Sailborne, Borbarshemphang B.	West Khasi Hills	M	NRM Organizer		Laban, Shillong
19	Saihic, I.H.	North Khasi Hills	M	PM/C	NCHCRMS	
20	Saikia, Inamul Hussaen		M	Project Technical Officer		
21	Sangma, Gary Chisin	West Garo Hills	M	Community Coordinator	BYACID	Tura
22	Sangma, Gereliush CH.	West Garo Hills	M		Don Bosco Youth Centre	Don Bosco Youth Centre, Tura, West Garo Hills, Meghalaya
23	Sangma, Hewingson A.	West Garo Hills	M	Revenue Officer	Garo Hills Autonomous District Council	Hawakhana Council Colony, West Garo Hills, Tura
24	Sangma, Rangku N.	West Garo Hills	M	Range Officer	Garo Hills Autonomous District Council	Tura
25	Sarma, Sri Dhrubajit	Karbi Anglong	M	PM/C	Karbi Anglong CRMS	Hamre, Assam
26	Tanchangya, Sudatta Bikash	Chittagong Hill Tract	M	Member Secretary	Committee for the Protection of Land Rights, Chittagong Hill Tracts,	Rajashthali, Rangamati Hill Tracts 4540, Bangladesh

27	Terandy, Bai	Karbi Anglong	M	Community Coordinator	Bangladesh Karbi Anglong CRMS	Hamren, Assem
28	Tripura, Gabriel	Chittagong Hill Tract	M	Program Coordinator	TOYMU	TOYMU, Beshanta Barua Building, P.O. & P.S. Bandarban, G. P. O. Box No. 13, Bandarban 4600 Bangladesh
29	Tripura, Mathura B.	Chittagong Hill Tract	M	Executive Director	Zabarang	Khagrapur, Khargrachari 4400, Bangladesh
30	Apang	Ukrul	M			
31	Atheng	Uknul	F			

List of Participants
Sasatgre, West Garo Hills

ID	Name	Song	Sex	Designation	Organization
1	Marak, Shri Denelhson R.	Sakaladuma	M	C.O.	Sasat Salakaduma NARM Group
2	Marak, Shri Widallin	Sasatgre			NARM Group
3	Momin, Gendilla G	Sakaladuma	F	Saljarang	Sasat Sakaladuma
4	Momin, Mejeng	Sasatgre	F	Member	Sasatgre Tackiana S. H. G.
5	Momin, Merene	Sasatgre	F	Salijalng	Sasat Sakaladuma
6	Momin, Nengjak G.	Sasatgre	F	Saljalng	Sasat Sakaladuma
7	Momin, Sjro Ballina G.	Sasatgre			NARM Group
8	Momin, Tangman G.	Sasatgre	M	Principal, Sasatgre	NARM Group
9	Momin, Thiponi G.	Sasatgre			NARM Group
10	Sangma, Bhiarnon	Sasatgre	M		Sasatgre Pring Prang NARM Group
11	Sangma, Chilling	Sasatgre	M		Nekwat NARM Group
12	Sangma, Gonoth	Sasatgre	M	Nokma	NARM Group
13	Sangma, Jeymar	Sasatgre	M	Member	NARM Group
14	Sangma, Lhri Balmong	Sasatgre			Sasat Sakaladuma NARM Group
15	Sangma, Majeng	Sasatgre	M	Member	NARM Group
16	Sangma, Mingja	Sasatgre		Member	NARM Group
17	Sangma, Nelbi	Sasatgre	M	Secretary	NARM Group
18	Sangma, Salmingson F.	Sakalgri	M		Nekwa NARM Group
19	Sangma, Shri Baljeng	Sakalgri		C.O.	NARM Group
20	Sangma, Siljar	Sasatgre		Member	NARM Group

TRAINING SCHEDULE AND CONTENT
Participatory Mapping and Resource Management Planning using 3D-Modeling
NERCRMP, Tura and Sasatgre, NorthEastern India
April 07 - 17, 2003

Participants:

NERCRMP Officers and Staff
Selected Sasatgre Community Members/Elders

Trainers:

Dave De Vera
Over-All Trainor/Coordinator

Engr. Randy Abeto
GIS/Mapping Trainer

Raquel Zingapan
GIS/GPS Trainer

Nicasio Caslangan
3D-Mapping/GPS trainer

TIME	TOPIC/SESSION TITLE	CONTENT	LOGISTICS
		DAY 1	
9:00-9:30	Opening Ceremo ny Prayer/Invocation Introduction		
9:30-10:00	Expectation Setting		
10:00-10:45	An Introduction to Mapping Methodologies: Traditional Mapping methodologies Participatory Community Mapping	Provides the basic information on the various mapping methodologies that are available. Discusses the differences, adaptability and appropriateness of available methodologies.	Overhead Projector, White Board/markers
10:45-11:00	Tea Break		
11:00-12:00	Understanding Maps and its Nomenclature	Discusses the evolution and history of mapmaking. Analyses the various types and categories of maps and its uses/users. Identifies the possible	Overhead Projector, White Board/markers

|		types of maps that the participant/s have produced and will potentially produce in the course of their work.	
12:00-1:30	Lunch break		
1:30-3:00	Basic Map Reading/Production	A show and tell session where participants will identify the basic components of a map. Basic skills in understanding map projection, scales, identifying locations and positions shall also be discussed and practiced by the participants.	Overhead Projector, White Board/markers, assorted contour maps at various scales; Meter stick, meter tape, protractor. Clear plastic sheet.
3:00-3:15	Tea Break		
3:15 - 5:00	Basic Map Reading	Continuation….Exercises on determining areas of polygons; distances of lines; location of points.	
Day 2			
9:00-10:30	Introduction to 3D Modeling	Discusses the history of 3D modeling its uses and the rationale of utilizing 3D modeling as a participatory resource planning tool. It shall also include a provide information on the basic steps of 3D modeling preparation, assembly and transposition of data to the model.	Overhead Projector, White Board/markers
10:30-10:45	Tea Break		
10:45-12:00	Spatial Data gathering/Analysis methodologies	Provides a discussion of the processes and methodologies used in extracting data using GPS, sketch maps and 3D models. Includes description of various data analysis tools that can be utilized using the 3D these shall include among others: Thematic map layering fo r the past, present and future land uses. Looking at movement of resources through time, calculating polygons using grid and Time lines .	Overhead Projector, White Board/markers
12:00-1:30	Lunch Break		
1:30-2:30	Orientation on GPS instrumentation	Provides an overview on the Global Positioning System; the referencing system it uses; the main components of the GPS and its data capture and post processing functions.	Overhead Projector, White Board/markers; GPS receivers, notebook/desktop PC.
2:30-3:45	Introduction to GIS: Spatial data digitalization, Data management and projection	Discusses and shows how spatial data generated from participatory mapping methodologies are	Overhead Projector, White Board/markers; GPS receivers,

		integrated to Geographic Information Systems (GIS). It shall provide an overview of the basic steps on digitizing data and the softwares/hardwares that can be used. It shall also include a discussion on developing a simple and basic data management system for storing and retrieving spatial data collected by fieldworkers.	notebook/desktop PC.
3:45-4:00	Tea Break		
4:00-6:00	Exercises on base map production	A show and tell session where participants will be given instructions on the production of base maps of their target management areas. From available contour maps, participants shall be made to scan, enlarge, printing tiles and sections of a map.	Contour maps at 1:50,000; scanner, Desktop PC, Photopaint software, A2 size paper, clear scotch tape, meter stick.
Day 3			
Whole day	3D Model Production:	Hands-on work on data preparation, Mgt. area identification and base map preparation and tracing.	Materials for 3D production
Day 4			
Whole day	3D Model Production	Hands-on work on Contour line tracing and cutting.	Materials for 3D production
Day 5			
Whole day	3D Model Production	Hands-on work on Contour line cutting and assembly.	Materials for 3D production
Day 6			
Whole day	3D Model Production	Hands-on work on Land-use coloring and coding	Materials for 3D production
Day 7			
Whole day	3D Model Production	Hands-on work on Land-use coloring and coding and thematic mapping. (Transposition of information)	Materials for 3D production
Day 8			
Whole day	3D Model Production	Hands-on work on Land-use coloring and coding and thematic mapping. (Extraction of information)	Materials for 3D production

Day 9			
Whole day	GPS Instrumentation Training	Hand-on work on GPS data capture. This will include building data dictionaries, features and attributes such as polygons, areas, lines and others. Its shall also have a lecture on understanding the basic GPS menu and set-up.	GPS Rovers, Notebook Computer, Blackboard, Chalk
Day 10			
Whole day	GPS Instrumentation Training	Hands-on work which shall include the development of a survey plan, conduct of an actual traverse to identify critical park markers such as geographical features (eg. rivers, jhums, trails) and boundary markers like core zone/buffer stakes/corners. The session shall also train participants on how to download all information gathered from the field and to situate and identify these in the contour/topo maps.	GPS Rovers, Notebook Computer, Blackboard, Chalk
AM	Closing Ceremonies and Awarding of Certificates		
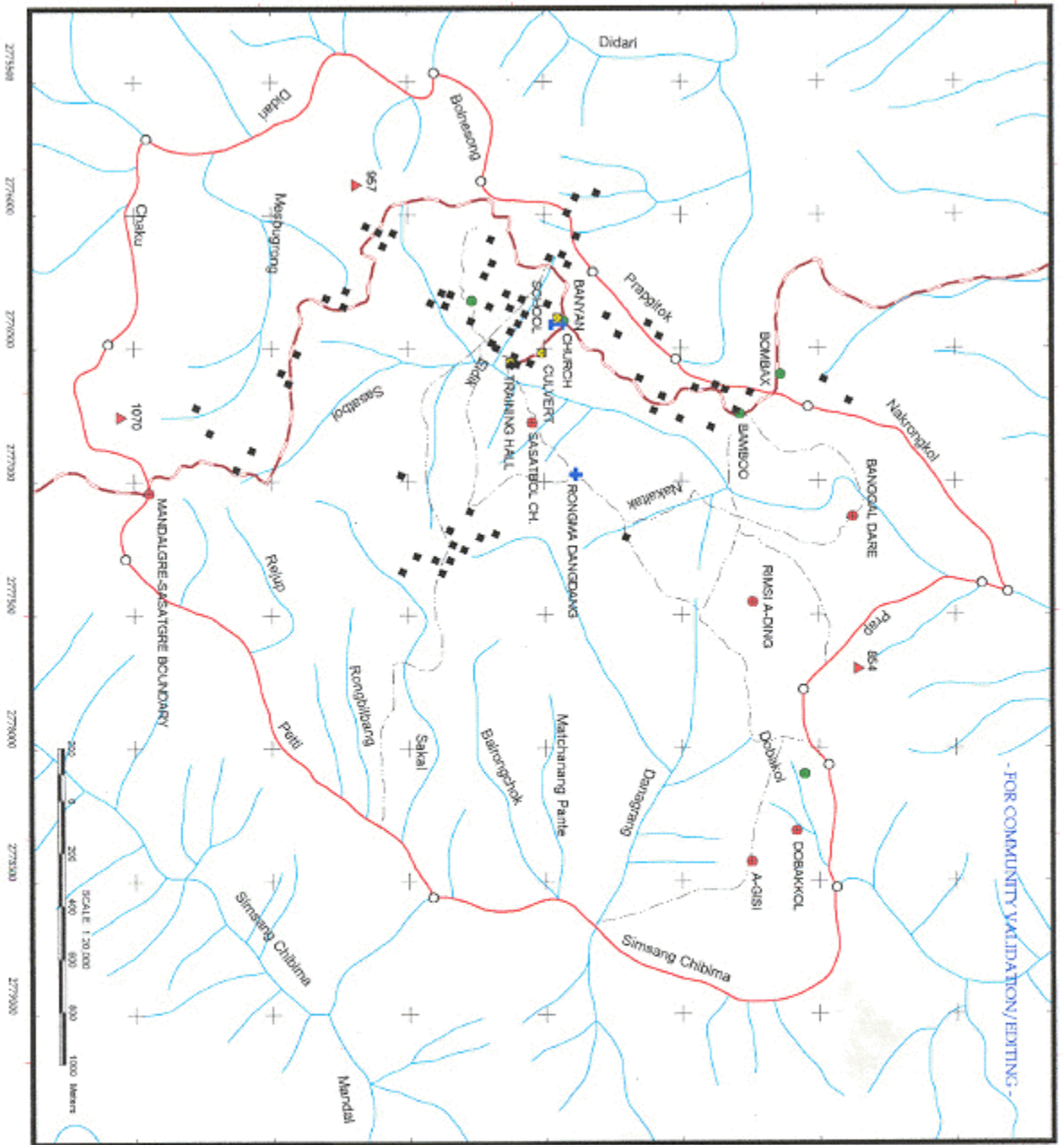
BOUNDARY MAP OF
SASATGRE AKHING

TOTAL AREA: 677.78 HAS

- FOR COMMUNITY VALIDATION/EDITING -
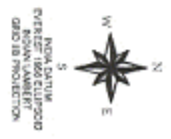
LEGEND

Landmarks
Church
Structure
Tree
Landmarks
Sacred Place
House
Mountain Peak
Stream Crossing
Boundary
Rivers & Streams
Roads & Paths
Dirt Road
Path

References:
1. SOI Topographic Sheet No. 78K6,
   1974.
2. WGHCRMS, GPS Survey of
   Sasatgre Landmarks, May, 2003.
3. Residents of Sasatgre &
   Sakaldurma, Sasatgre Relief Map,
   May, 2003.
4. Akhing boundary supplied by
   Sasatgre Nokma, May, 2003.

Thanks to:
MISEREOR

Map Production:
Philippine Association for
Intercultural Development, Inc.
pafidinc.com.ph

SCALE 1:20,000

SASATGRE
PRESENT LAND USE
May, 2003

- FOR COMMUNITY VALIDATION/EDITING -

LEGEND

TOTAL AREA: 677.78 HAS.

INDIA DATUM
EVEREST 1956 ELIPSOID
INDIAN LAMBERT
GRID IIB PROJECTION

Land Uses

Ata Chapge	55.626 has.
Ata Osagpa Buring	306.610
Apal	22.607
Konda Began	8.183
Manbu Cha Arram	62.061
Reljep	28.200
Rijonga Dongilrim	63.415
Buring	0.214
Riteki Karam	10.857
Rbong Petal	72.691
Song Gooram	
Sasatgre	62.205
Sakalaburna	10.689

Landmarks
Landmarks
Sacred Place
House
Mountain Peak
Stream Crossing
Boundary
Rivers & Streams

Roads & Paths
Dirt Road
Path

References:
1. SOI Topographic Sheet No 78K8, 1974.
2. WGR/CRMS, GPS Survey of Sasatgre Landmarks, May, 2003.
3. Residents of Sasatgre & Sakalaburna, Sasatgre Relief Map, May, 2003.
4. Aiching boundary supplied by Sasatgre Nokma, May, 2003.

Thanks to:
MISEREOR
Philippine Association for Intercultural Development, Inc.
paidsgid@gmail.com
Map Production

Didari
Bolnasong
Chaku
Mesugorong
Prangitok
Nakronghol
TRAINING HALL
SASATBOL CH.
RONGMA DANGDANG
BANDGAL DARE
Naksikak
RIMSI A-DING
854
MANDALGRE-SASATGRE BOUNDARY
Doniwe
DOBAKKOL
A-GISI
Reljep
Petil
Sakal
Rongbibang
Batrongchok
Matcharang Pante
Dimsang
Simsang Chibima
Mandai
Simsang Chibima

SCALE 1:20,000