



## **Participatory 3-Dimensional Modelling Workshop**

**6 to 12 November 2010  
Kinabalu Park**

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This workshop is part of the Darwin Initiative projects in Ulu Papar  
by the Global Diversity Foundation, Sabah Parks, Pacos Trust and the Ulu Papar community

## **Background to participatory mapping in Ulu Papar**

Participatory mapping, otherwise referred to as community mapping, is a commonly used participatory action research technique to visually display the link between local peoples and the land or seascapes. This includes the community's perceptions and classifications of surrounding land or seascapes, locations of important resources, and sites of cultural significance. Over the years and in many places across the world, participatory maps are being used by communities and external facilitators to enable effective land use planning and communication within communities, foster dialogue between communities and external agencies, and to exert community authority over ancestral territories, lands and resources.

Under a previous Darwin grant, we applied a participatory mapping process to consolidate our efforts to document land and resource use patterns in Buayan-Kionop. Over a series of community workshops, community members worked together to develop a sketch map showing the locations of important features such as rivers and tributaries, village locations and customary boundaries, individual house locations, agricultural fields, hunting areas, places where important plants can be found, and places of historical and cultural significance. Using GPS devices, we then trained community researchers to work with their community members to ground-truth the information displayed on the sketch map. Georeferenced data was then uploaded to produce GIS maps of community resource use patterns in Buayan-Kionop. However, we soon found that each of the mapping processes used had its weaknesses; sketch maps were not accurate and two-dimensional GIS maps were confusing and inaccessible for many community members, especially the elderly.

Wanting to encourage meaningful community participation, we launched a participatory 3-dimensional modeling (P3DM) process in 2007. This method integrated sketch mapping and GIS mapping to produce a stand-alone relief model. Over the course of six months, we worked with Resource Catchment Assessment (RCA) Team members to construct a 3D model of the Buayan-Kionop Resource Catchment Area. The model was built to scale therefore making it possible to merge the indigenous spatial knowledge displayed on the model with georeferenced GIS maps of Buayan-Kionop. Importantly, because the model was manufactured in the village itself, the model-making process attracted the attention of many community members. Each stage in the model-making process involved simple, low-tech actions, from tracing, cutting, gluing to painting, which made it an activity where everyone could participate, regardless of age, gender or educational background. For our work, P3DM was ideal because of its simple and dynamic approach, enabling fuller community input by facilitating open participation and knowledge-sharing from all demographic sectors of the community.

With Buayan-Kionop model being permanently stored in Buayan, we found that an immediately accessible 3D replica of their ancestral lands was an irresistible springboard for elderly community members to share their knowledge on resource areas and cultural landscapes. Community researchers have been conducting regular sessions where community members come together to update the model, where each new layer of data is then photographed and uploaded to the GIS database for the Buayan-Kionop Resource Catchment Area. In this way, the model is never "complete"

because it continues to be updated as land and resource use changes occur, and new knowledge can be added at any time.



*A model-updating session held in Buayan in March 2011. Community researchers work with their community members to upload new data on gravesites (left) and hunting trails (right). Each layer of new data is then photographed and uploaded to GIS maps of Buayan-Kionop.*

With the subsequent, and hence the present, Darwin grant, the scope of our work had been expanded to include Terian, Kalanggaan, Pongobonon, Longkogungan, which are villages located upriver from the Buayan-Kionop villages. As such, it became necessary to “expand” the Buayan-Kionop P3D model to incorporate the entire Ulu Papar valley. After some discussion with community researchers and leaders, it was decided that the existing Buayan-Kionop P3D model would be left alone and remain in its service to the Buayan-Kionop villages. There was initial discussion about the prospect of making a P3D mini-model for each individual village, but this option was rejected because the scale of the mini-models would be too small to be useful for data-management and there were not enough community researchers in each village to keep individual P3D models active and ensure that data-management would be standardised.

Instead, it was decided to embark on the construction of a single, large P3D model that would incorporate the entire Ulu Papar valley. Named the Ulu Papar P3D model, the 2 x 1.5 metre-sized model represents an area of 19,200 hectares at a scale of 1:8000. This model would be housed permanently in the village of Kalanggaan, being the most centrally located village upriver.

### **Ulu Papar P3DM training workshop**

To launch the process, we planned a P3DM training workshop to orient our new crop of community researchers as well as a refresher for RCA Team members and existing community researchers. We felt a “training of trainers” workshop was a strategic opportunity to use the Buayan-Kionop P3DM process as a platform for advancing our work by capitalising on lessons learnt and innovating refinements to the participatory process. As such, we designed a one-week training workshop where RCA Team members and community researchers could come together in Buayan to construct the Ulu Papar P3D model.

Unfortunately, this planned workshop had to be cancelled due to extreme weather conditions and unpredictable flooding in Ulu Papar, leaving the team faced with the

prospect of having to postpone the Ulu Papar P3DM process for an indefinite period. Fortunately however, Sabah Parks was, at the same time, in the process of constructing a scaled relief model of Kinabalu Park and was in need of technical assistance. A deal was struck: the Ulu Papar P3DM training workshop was moved to Kinabalu Park with Sabah Parks providing adequate space for our workshop needs; a move that also enabled our team to assist Sabah Parks staff in their own model-making process.

A number of Ulu Papar community researchers were able to join the rescheduled training workshop in Kinabalu Park, where a decision was made to proceed only to the point of constructing a blank model. The remainder of the process of legend-making and data-entry would be continued at the village-level in Ulu Papar once the weather made it permissible for the Ulu Papar model to be moved to Kalanggaan.

### Programme

The Ulu Papar P3DM training workshop was successfully held from 6 to 11 November 2010 at Kinabalu Park (see appendix). Twenty-eight people attended this workshop, comprised of Ulu Papar community researchers, Sabah Parks staff and GDF Coordinators (see appendix). Six people were community researchers from Bundu Tuhan and Kiau Nuluh, two indigenous Dusun communities located at the foothills of Mount Kinabalu, who came because they were interested in applying P3DM approaches with their own community<sup>1</sup>.

The workshop began with main presentations introducing P3DM and recapping the P3DM process for the Buayan-Kionop model. Due to scheduling conflicts<sup>2</sup>, it was necessary to conduct this segment of the workshop on 6 November (Saturday) so that Ulu Papar community researchers Raymond Sipanis, Jenny Sanem, Louis Bugiad and Theresia John could co-deliver the presentations with GDF Coordinator James Wong. These particular community researchers played key roles in facilitating the construction of the Buayan-Kionop model and continue to keep the model active in their community. We felt the experience and expertise gained from the Buayan-Kionop P3DM process was an



*From top: Preparing carbon papers to trace contour lines; Tracing the contour lines; Cutting out the contour layers.*

<sup>1</sup> Participation of Bundu Tuhan and Kiau Nuluh community researchers was supported through a grant from Diversity Consultancy Sdn Bhd, one of GDF's local partners in Sabah.

<sup>2</sup> Ulu Papar community researchers Raymod, Jenny, Louis and Theresia were to join the Photography and Conservation Education workshop held concurrently at Inobong Research Station, which started on 7 November; thus 6 November was the only time they were available to participate in the P3DM workshop in Kinabalu Park.

important consideration that enabled us to build on lessons learnt and capitalise on existing in-house capacity, and thus enhance the impact of the new Ulu Papar P3DM process.

In their presentations, the team walked through the basics of model-making, stressing the role of the community in the defining the process and the importance of ensuring that the process remained community-owned. The team explained how model-making should be used as an enabling platform where community members could come together to discuss how they want to portray their resource use patterns and the places that are important for them. They also talked about the challenges faced in constructing and maintaining the Buayan-Kionop model and made recommendations on how the process could be improved.

On 8 November (Monday), the group reconvened to begin the construction process. Participants were divided into small groups, where each group had a specific task. The first task was to transfer the contour lines from the base map to the cardboard layers by using carbon paper to trace one contour line onto a single cardboard layer. Each contour line that was completely traced was then sent to another group who cut along the contour lines, creating a cardboard cutout in the shape of the contour line. The resulting cardboard cutouts were then stacked carefully on top of each other.

This tracing, cutting and layering process continued until all the cardboard cutouts were stacked in place and a 3-dimensional relief model was formed. Groups then began applying glue to the relief model, always making sure that the cardboard cutout layers were maintained in the correct position. Once the cardboard layers were securely fastened to each other, the glueing process continued with groups sticking tissue paper onto the surface of the relief model. This procedure was to flatten the edges of the contoured cardboard layers so that it started to take on a smooth gradient, mimicking the surface of the earth.

The model-making process became quite slow at this stage because of the cold wet weather of Kinabalu Park. It took a long time for the glue to dry due to the damp atmosphere, which was not made any better by the constant rain and mists outdoors. Groups used electric fans,



*From top: Contour cardboard layers are staked on top of each other; Stacking continues until all contour layers are in place; Participants begin to glue tissue paper on the layers; Glueing continues until the whole model is completely covered in white tissue.*

portable heaters and hand-held hair-dryers in an attempt to speed up the drying process. Eventually, the blank model was completed, which meant the entire relief model had been built with a smooth white surface on top. Ulu Papar community researchers helped to enter initial data to provide general orientation, such as locations and names of main rivers, important hills and the park boundary.



*The completed blank model with initial information such as park boundary, names of rivers and hills*

This completed the work for this stage of the Ulu Papar P3D model. The subsequent legend-making and data-entry stages would be conducted in Ulu Papar with community members in that area.

At the same time, Sabah Parks staff members working on their relief model of Kinabalu Park were also nearing completion. Their model was for exhibition purposes only and was not intended to be a participatory process, so staff members proceeded with painting and marking the Kinabalu Park model, which was later used as a centrepiece exhibit for the 10<sup>th</sup> Anniversary celebrations of Kinabalu Park as a UNESCO World Heritage Site.

## **Evaluation**

At the end of the workshop, an informal evaluation was conducted to collect feedback from participants. Everyone came together for a review of the training process and a discussion about how it could be improved. Generally participants were very happy with the training environment, despite the cold damp weather. Almost all of the Ulu Papar community researchers at this workshop were new to the P3DM process, as those researchers who had been through the Buayan-Kionop P3DM process were attending a parallel Photography and Conservation Education workshop in Inobong Research Station. The new crop of community researchers admitted to being a bit confused at the beginning when they were listening to the opening presentations as it was hard to visualise how a model could be made from cardboard and tissue paper. However, having gone through the practical sessions and built the 3D model with their own hands, they felt confident, proud and understood how the process worked.

Sabah Parks staff enjoyed the opening day presentations, which they said were well delivered and presenters were able to answer the questions posed very well. Many admitted they were quite stressed because they had to work on two models at the same time, but they were impressed with the level of cooperation and sharing between community researchers and park staff. They hoped the sharing of physical energy and problem-solving ideas would continue in future.

Overall, participants agreed the programme was a success and that they gained new knowledge about model-making. Many applauded the spirit of collaboration between community members, park staff and GDF Coordinators, which made it a fun learning environment.

## Appendix: Programme

Date	Time	Activities
6 Nov Sat	2.00pm – 5.00pm	<u>Presentation:</u> Overview of workshop programme Methods and process in Participatory 3-Dimensional Modelling
8 Nov Mon	8.00am – 4.30pm	<u>Practical (including breaks):</u> Using a topographical map to create model layers (tracing and cutting)
9 Nov Tues	8.00am – 4.30pm	<u>Practical (including breaks):</u> Continue cutting layers Applying surface layer to model
10 Nov Wed	8.00am – 4.30pm	<u>Practical (including breaks):</u> Applying surface layer to model
11 Nov Thurs	8.00am – 12.30pm	<u>Practical (including breaks):</u> Inputting basic data
	2.00pm – 3.00pm	<u>Summary:</u> Review and evaluation of the workshop