Modeling the Future:

Participatory 3D mapping helps Boe Boe community plan for climate change impacts and other development challenges

Choiseul Province, Solomon Islands. *By Esther Ririmae and James Hardcastle, March 2011*

74-year old Ellen Taqevala silenced the crowded meeting hall as she took everyone on a journey from the old village site in the hills, over Snake Ridge, and down the forest path to the narrow coastal plain where the Boe Boe village is now situated, amongst the mangroves and dark-sanded beaches. She became emotional as she recalled the circumstances of that journey, 60 years before, during World War II. It is a journey that Ellen has not physically made herself for more than four decades. Her memory was reconnected to place and time through a large 3-dimensional model of the Boe Boe customary lands that the villagers had crafted and created during a week-long hive of activity in the centre of the community.

74-yr old Ellen describes the Boe Boe village environment using the 3D model

The model had turned a conventional flat contour map of their area into a physical, hands-on relief-model that everyone could see, feel, touch and connect with. The experience was enlightening for all. Men and women, young and old, could see their local area and represent their own 'mind maps' onto the model.

Jean and her friends point out their canoe route from the village to the island gardens and mangroves

"I am adding the route we women use to paddle to the garden areas in the islands and across the bay" said Jean Vakaele, a local mother who, like many village women, spends much of the day out in the gardens and mangroves collecting food and shellfish for the daily meals, or to trade. Paintbrush in hand, she added "it takes us two hours if we paddle fast. I know the way and can see it on the model so I am

painting it on. I had never seen the route before on a map, now I can see the whole islands and coast where we usually go, nearly every day. It is easy to find places that we see on the way".

The model was built by students and volunteers from the village, guided by teachers, elders and invited guests from neighboring communities. The exercise was facilitated by Kenn Mondiai, from **Partners With Melanesians**, with a team from **The Nature Conservancy**. The event was organized in Boe Boe by the **Lauru Land Conference of Tribal Communities**, a representative

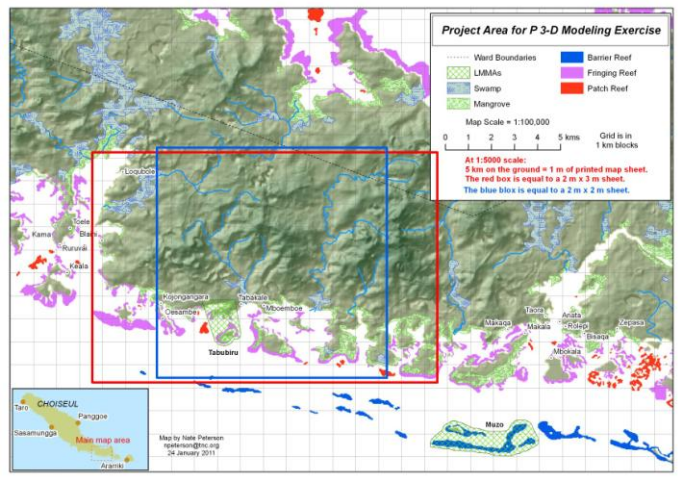
Stages in building the 3D model in the Boe Boe community hall

organization for the Lauru people of Choiseul Province, supported in turn through a project partnership from **Australia's International Climate Change Adaptation Initiative**. Over three days, small teams of students and community volunteers traced contour lines from maps onto carton sheets, then cut them out and glued each layer onto a large table, to build up the physical model. Once the layers were added and the hills and valleys had taken shape, the model was covered with papier-mâché, ready for the community to add detail.

Led by Chief David Hamekaza, community members gathered around the model to discuss and identify key features and areas that they wanted to display on the model. Rivers, streams and pathways came first; then the buildings and houses of Boe Boe village. 'Tambu' areas of protected forest and reef came next, then the mangrove and coastal coconut plantations. Information and features kept on flowing, as groups of women and children added detail based

on their own perceptions of the land and their environment. Interesting features that emerged included WWII plane wrecks on the reefs, and crocodile nesting sites on the offshore islands!

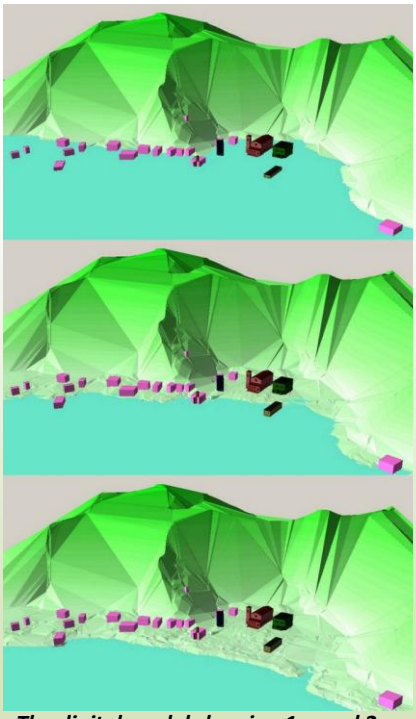
As the model took shape, so did some issues facing the village begin to emerge. A parallel household survey on community resilience contributed to dialogue on the potential impacts of sea-level rise and other climate-related events, as well as other natural hazards such as Tsunami. The surveys highlighted the strong governance and traditional leadership in the village, the community reliance on subsistence fishing and agriculture, but also low awareness of climate change and its potential impacts.



The Project Area Map for the model at 1:5,000 scale, covering 198 km²

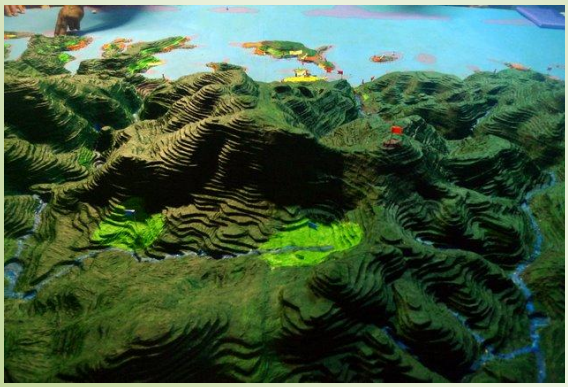
The model showed the extent of the previous tsunami from 2007, and recent king-tide levels that inundated parts of the village. The community used the model to discuss these and other climate- and risk-related issues, and to explain early strategies and 'adaptation' efforts that the community is planning. These ideas were, literally, 'put on the table'. They included ecosystem-based approaches, such as establishing conservation areas and reinforcing the traditional tambu sites and rites over the streams, islands, mangroves and watershed forest of Snake Ridge. The overgrown gardens of the old village location in the hills, that Ellen revisited, may now be developed as a safe-haven in times of need.

Javier Leon, with the University of Wollongong, provided more 'scientific' information through digital elevation modeling and the use of a high-tech GPS unit. Gathering many GPS points, Javier created a digital animation of the village showing the extent of the previous Tsunami event, as well as displaying the possible levels of inundation that may occur over time with predicted sea-level rise of 50cm, 100cm and up to 200cm. In combination with the 3D relief model, this enabled a powerful match and medium to connect science with local knowledge.


The digital model showing 1m and 2m sea-level inundation in Boe Boe.

Importantly, the model has contributed greatly to simple economic perspectives on the costs and benefits of different adaptation scenarios, as people gain a better understanding of the spatial implications of climate change. For example, as the model allowed contributions from all members of the village, Jean pointed out that the loss of gardens due to salt-water intrusion nearby would mean she and her friends would be paddling for up to an hour or more longer, each day, just to gather food. That is a considerable cost that needs to be part of decision-making. With their model taking pride-of-place in the community hall, the village will be able to use it for their own planning and development purposes for the next few years to come. Outside development interests are increasingly seeking out Choiseul's natural resources, and information and spatial awareness will be vital for communities to negotiate access to and development of their own customary lands in a transparent and accountable manner.

Features include rocky shores, coconut plantations, and reefs



Aerial view from Snake Ridge to Boe Boe village on the coast

At the Provincial Government level, these costs and benefits are being considered. Gideon Solo, the provincial climate change officer helped conduct the household surveys on community vulnerability, and says "I am beginning to see a pattern emerge for Choiseul. Climate change impacts are already evident but [we see that] that many communities are reacting well and developing plans. We need to find ways to support them in their efforts."

The climate change vulnerability work in provinces such as Choiseul helps inform national programs and policies on adaptation, such as through the regional Coral Triangle Initiative that includes Solomon Islands alongside countries such as Papua New Guinea and Indonesia. However, adaptation action must take place at the local level - in the words of Jimmy Kereseka, the development coordinator for the Lauru Land Conference of Tribal Communities, "this model was made by the community and is owned by all the people of Boe Boe. It us up to us Lauru people to take the initiative on community issues and ensure our traditions and customs are not compromised by development pressures or outside forces such as climate change."

*For more information on Participatory 3D modeling, visit **www.iapad.org**. For information on the Australian Government / AusAID-funded project 'Building the Resilience of Communities and their Ecosystems to the Impacts of Climate Change in the Pacific", please contact James Hardcastle, **jhardcastle@tnc.org** and visit **http://community.eldis.org/.59deef0e/***