

# UNESCO SC and CI Sectors

## Village-level Documentation and Transmission of Local Environmental Knowledge

### BRIEFING NOTE

The CI-SC Marovo project is unique because of its association of an exceptional resource in support of Pacific Islander language and knowledge (the Marovo Encyclopaedia) and a creative delivery mechanism for remote rural schools that fosters indigenous knowledge as a living and dynamic resource owned by the communities themselves (the proposed Marovo wiki and OER). This pilot project is therefore of considerable significance not only for Solomon Islands, but also for countries and sites across the Pacific where there is a demand for quality education that reinforces vernacular languages and local content.

The original 2005 project provided a model for indigenous knowledge management with accompanying guidance for teachers to support the country's vernacular education policy.

The new project phase aims to leverage the existing ICT networking in Marovo to add a new dimension to this resource – the ability for schools and communities to add to and improve the resource dynamically and hence engender real ownership of the process as well as the resource. It also aims to empower the teachers to collaborate with each other and the Ministry, to develop accompanying lesson plans that are aligned with specified educational objectives, along with mentoring, monitoring and quality assurance. This new phase therefore addresses issues such as ownership, scalability and replication, for instance:

- **Replication.** The original paper-based, labour-intensive approach that results in a fixed (static) resource, is impracticable to replicate in other provinces. An OER/ICT-based approach where local teachers and students create the content themselves would be much more practicable, once the infrastructure is in place. Replication is not only about the technology framework, but the human collaboration, school activities and methods pioneered by the original Reef and Rainforest project.
- **Sustainability.** The wiki approach, with networked schools and community participation, ensures that the resource is both dynamic and owned by the communities themselves. The networking component impacts favourably on inclusiveness, technical support, monitoring and mentoring.
- **Scalability.** A wiki based model can be scaled indefinitely with no printing or logistical costs. The main challenge is connectivity. In the medium to long term, connectivity in rural areas is improving rapidly, as is availability and ownership of computers and especially of mobile devices. All of these constitute potential delivery modes (and portals for participation). The network infrastructure exists in Marovo such that ten or more additional schools could be connected very quickly. In other provinces, access facilities such as the DLCs could become hubs for participation in replicated programmes. In addition, Marovo teachers, students, speakers located away from Marovo itself, will also be able to participate.
- **Ownership.** As the content is created by the real owners of the indigenous knowledge, the wiki/OER approach strengthens their ownership of the process as well as the resource. There is also very strong local Marovo ownership of the ICT component of the project; the Patukae RICS and Wi-Fi network is now operating sustainably as a public-private partnership, with costs shared between the schools, communities and Uepi Resort according to an agreement made between them. Furthermore, the ICT creates a much more supportive environment, where on-going active participation is more likely to be driven by the teachers themselves.

Ownership of the Reef and Rainforest wiki after the project phase closes, will therefore reside with the Marovo schools. Risks associated with sustainability of the ICT are already addressed.

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### OTHER EXPECTED POSITIVE IMPACTS

- An OER resource becomes accessible over the Internet, and the content can be reused, revised and contextualised by other language groups across the Pacific. For instance, entries associated with a particular plant that exist in another location could be accessed and studied in schools, and then localised for their own language resource/wiki.
- The project will help align classroom use of OLPC with the curriculum. The OLPC laptops will be used to generate multimedia content for the wiki, within a structured process using approved lesson plans. The model can then be applied more generally to the OLPC programme – for instance the lesson planning tool.
- The project also helps to “complete” the OLPC pilot at Patukae, and demonstrate the school server.
- The pilot will provide a rich demonstration of the potentials of Open Educational Resources (OERs) and related technologies. In particular CDC might benefit from lessons learned and consider how the same approaches might be applied more generally, or to meet specific curriculum needs;
- The pilot will demonstrate quick wins with ICT that could be applied in existing rural schools with some Internet access - both urban and the DLCs.

### SCHOOLS PARTICIPATING IN THE PROJECT (SEE MAP IN ANNEX)

The proposed project will be run at Patukae College, with Chubikopi and Hinakole primary schools participating through their existing connections and community access facilities. Cheara Clinic could also be used for Cheara village community to participate. With some limitations due to the status of the Mt Mariu Wi-Fi link connecting Bekabeka DLC with Batuna AVC, Batuna, Bekabeka and Sombiru schools can also participate.

The project could be scaled up quite easily. 11 additional schools could be connected to the Patukae-based Wi-Fi network using equipment costing approximately SBD 25,000 per school (see annex). Adding FM “community” radio would also be an effective way of widening participation/inclusiveness

### BASIC OUTLINE OF PROJECT (SEE ANNEX FOR DETAILS)

1. Wiki version of the Reef and Rainforest resource created by UNESCO, to be published on the Internet.
2. Local contributions to the wiki will be made in various electronic formats through school activities.
3. Training will be given to the teachers on how to manage educational activities that generate such content.
4. A WikiEducator-based portal will be provided with tools for creating lesson plans from templates.
5. A review will be made of existing uses of the encyclopaedia and existing formal/informal lesson plans;
6. The lesson plans will be drafted with attention to strict criteria (see annex for details)
7. A server computer will be installed at Patukae, accessible also by any school connected over the WAN.
8. Schools will upload their content to the local server to be moderated before uploading to the online wiki
9. A quality assurance procure will be designed and agreed to ensure the integrity of the indigenous content.
10. Workshops will be held for training, testing, piloting and to launch the project with the Marovo community.
11. An online community of practice, with both face to face and online mentoring will support the project 3-5m.

Attached Annex:

1. Outline of project
2. References
3. Map and background to the ICT network in Marovo (Marovo Learning Network)

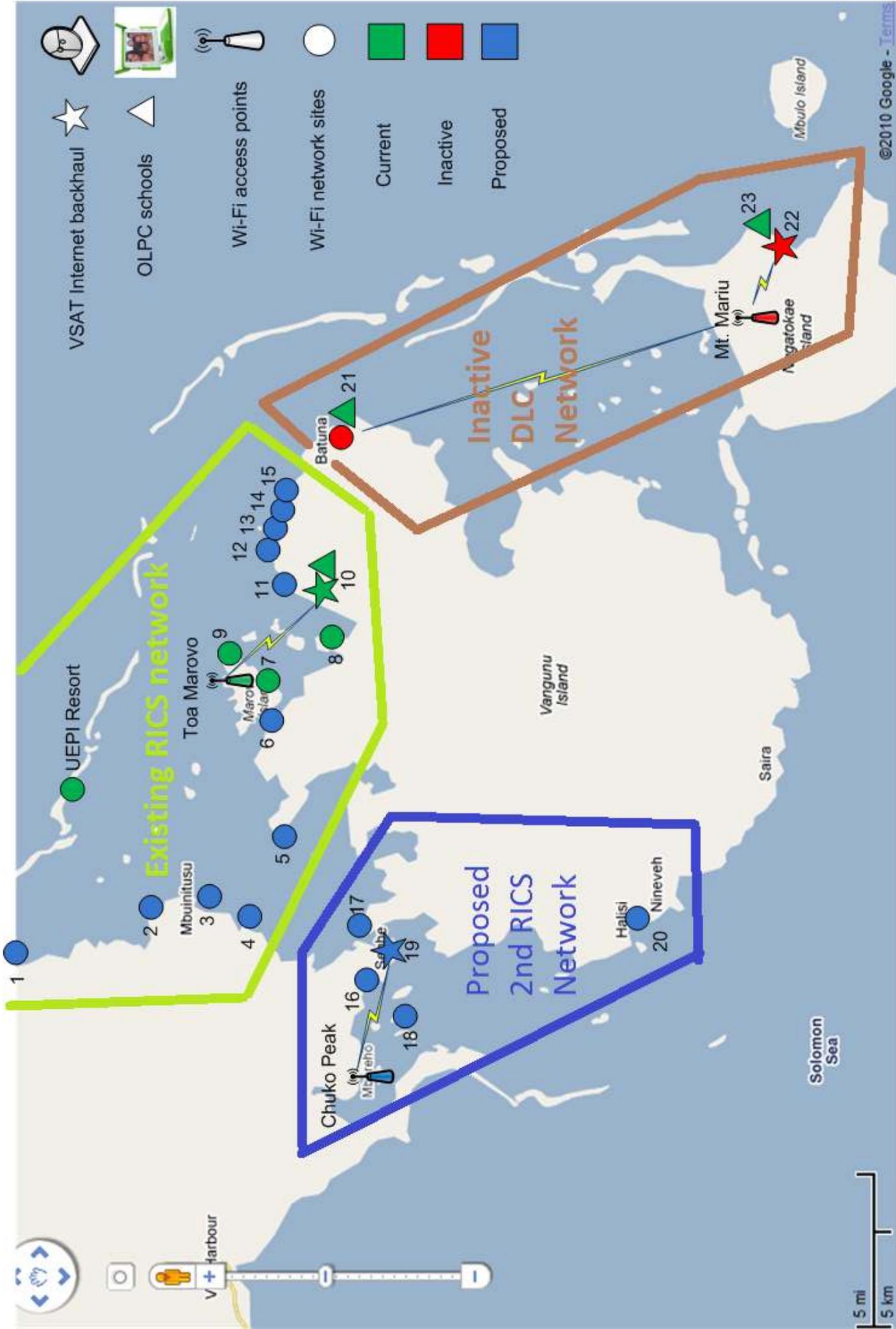
Prepared by David Leeming ([david@leeming-consulting.com](mailto:david@leeming-consulting.com)) Oct 21<sup>st</sup> 2010

# ANNEX

## OUTLINE OF PROJECT

1. UNESCO have developed a dedicated wiki version of the Reef and Rainforest resource. This will be published on the Internet.
2. Local contributions to the wiki will be made in various electronic formats, from simple text to photographs and drawings, audio and video. In addition some formats from the OLPC laptops that generate interactive content – such as “Memorize Game” which creates match pairs (for instance photos of objects and their Marovo names), and eToys which can create animated multimedia objects.
3. Guidance and training will be given to the teachers on how to manage educational activities that generate such content. This will be through initial drafting of some example lesson plans, and the provision of a WikiEducator-based portal with tools for creating lesson plans from templates – so empowering the on-going development of the educational use of the Marovo wiki.
4. A review will be made of existing uses of the encyclopaedia in Patukae, and existing formal and informal lesson plans;
5. The lesson plans will be drafted with attention to strict criteria:
  - Compliant with identified objectives of the current Solomon Islands National Education Action Plan (NEAP) and SIG Strategic Development Plan;
  - Strongly integrated with the current Solomon Islands Ministry of Education curricula for science, technology, environment, mathematics and other related subjects;
  - Spread over an agreed Year range
  - Encouraging respectful group work between the girl and boy students to encourage Gender Equality
  - Highlight the unique role of women to encourage Gender Equality
  - Encourage group work between students and community
  - Conforming with traditional practices of restricted information, as some information may not be shared
6. An server computer will be installed at Patukae, with some strengthening of the solar power supply. It will be made accessible to not only Patukae but any school connected over the Wi-Fi (including the schools mentioned above). The server will combine:
  - the OLPC XS school server, with all the OER resources that have been collected together by SPC and partners in the regional OLPC pilots;
  - a local copy of the UNESCO Reef and Rainforest wiki to serve as a local “buffer” prior to quality assurance
7. Schools and other contributors will upload their content to the local server (either the XS or the UNESCO wiki depending on format) and will be moderated before uploading to the online wiki;
8. A quality assurance procure will be designed and agreed whereby a local team at Marovo review and assure the accuracy and suitability (and other factors as will be agreed) before uploading the content to the main online wiki. It is felt that this intermediation is needed to ensure the integrity of the indigenous knowledge. However, otherwise the content will be attributed to the contributor and consistent with principles of OERs
9. Workshops will be held to provide the training, initial testing and piloting and to launch the project with the Marovo community.
10. An online community of practice will be established via a Google Group, and both face to face and online mentoring will support the project for 3-5 months at least.

# ANNEX



## ANNEX

### KEY AND SCHOOLS / COMMUNITIES DETAILS

Key	Name	2009 enrolment		
		Male	Female	Total
1	Vakambo Primary School			151
2	Ngaringari Secondary School (proposed site)			
3	Mbunitusu Primary School			66
4	Chuchulu primary School			52
5	Miche Primary School			69
6	Mount Sumolobo Primary School			
7	Chukopi Primary School			144
8	Cheara Rural Health Clinic	n/a	n/a	n/a
9	Chea Village	n/a	n/a	n/a
10	Patukae Primary School (and RICS VSAT) Patukae Secondary School	71	59	130
11	Rukutu (Primary School / Village ??)			
12	Telina primary School			30
13	Cheke Primary School			
14	Chemoho Priomary School ??			
15	Mbisuana Primary School ??			
16	Nazareth primary School			148
17	Patutiva Primary School Patutiva Secondary School			152
18	Bareho Primary School			136
19	Seghe primary School (and RICS VSAT)			138
20	Halisi primary School			120
21	Batuna Primary School (and Adventist Vocational College)			116
22	Sombiro Primary School			88
23	Bekabeka Secondary School (and DLC VSAT)			

### Not shown on map

	Zaira primary School			30	n/a
	Hinakole primary School (close to Chea Village)			102	n/a
	Ulona primary School				n/a
	Buleani Village	n/a	n/a	n/a	n/a
	Cheara Village	n/a	n/a	n/a	n/a

# ANNEX

## SUMMARY OF THE MAROVO LEARNING NETWORKS

### PATUKAE RICS NETWORK / TOA MAROVO ACCESS POINT

Patukae College consists of a primary and secondary school on the same campus. Patukae currently hosts (a) a VSAT, (b) extended Wi-Fi network utilizing Toa Marovo island as an access point, (c) an OLPC project (all teachers and 100+ students of the primary school). Scots College of Australia recently donated equipment for a PC computer lab. Details:

- 1.2m VSAT installed at Patukae College in 2008, as one of the pilot sites under SPC's PacRICS programme.
- Wireless coverage is provided for the central Marovo area via a Wi-Fi tower access point on Toa Marovo island, overlooking Chubikopi.
- The operation of the network is managed through a committee, and the entire on-going costs are shared between the school, communities and Uepi.
- In 2009, two villages, Chubikopi and Chea (both having primary schools) and Cheara Clinic were connected using donated equipment from Uepi guests. Each has a netbook computer, Wi-Fi receiver and solar power.
- In 2008 a survey was carried out showing that as many as 11 additional schools have line of sight to the Toa Marovo tower, and could be connected. Each would need a Rural Link Wi-Fi receiver, one or more netbook computers and solar power. This could cost less than SBD 25,000 per site.
- All remote sites connected to the network can access both the Internet, plus any local servers such as could be installed at Patukae.
- Patukae, Batuna and Sombiro are all pilot schools for MEHRD's OLPC pilot programme. 375 laptops have been distributed during 2008 and 2009 to all primary school students and teachers. In 2010 an independent evaluation was published by Australian Centre for Education Research (ACER). The schools do not have the XS servers or means for charging laptops during the day.
- SPC have suggested that Patukae would make a very good site for the addition of an FM radio station. The signal would be carried by the Wi-Fi to an antenna at the Toa Marovo mast, giving coverage across the Lagoon. Accordingly, a workshop was held at Patukae in Dec 2009 funded by Commonwealth of Learning. This established a great deal of interest in the community for such a facility.

### PATUKAE RICS COMMITTEE MEMBERS

The current members are:

Mr. Brian Bird	Chairperson	Headmaster, Patukae Community High School
Mr. Grant Kelly	Vice Chairperson	Proprietor, Uepi Resort
Mr. Jason Kelly	Treasurer	Uepi Resort and Marovo Sustainable Timbers
Mr. Thomas Kivo	Secretary	
Mr. Alrick Jimuru	Community Rep	Chea Village
Mr. Loyd Nonga	Community Rep	Operator, community access facility, Chubikopi
Mr. Alar Bright Bird	Community Rep	Buleani Village
Mr. Pareti Ngini	Community Rep	Rukutu Village
Mrs. Violin Hong	Church Rep	
Mrs. Hezilyn Philip	Women's Rep	
Mr. John Bitibule	Cheara Clinic Rep	Ministry of Health

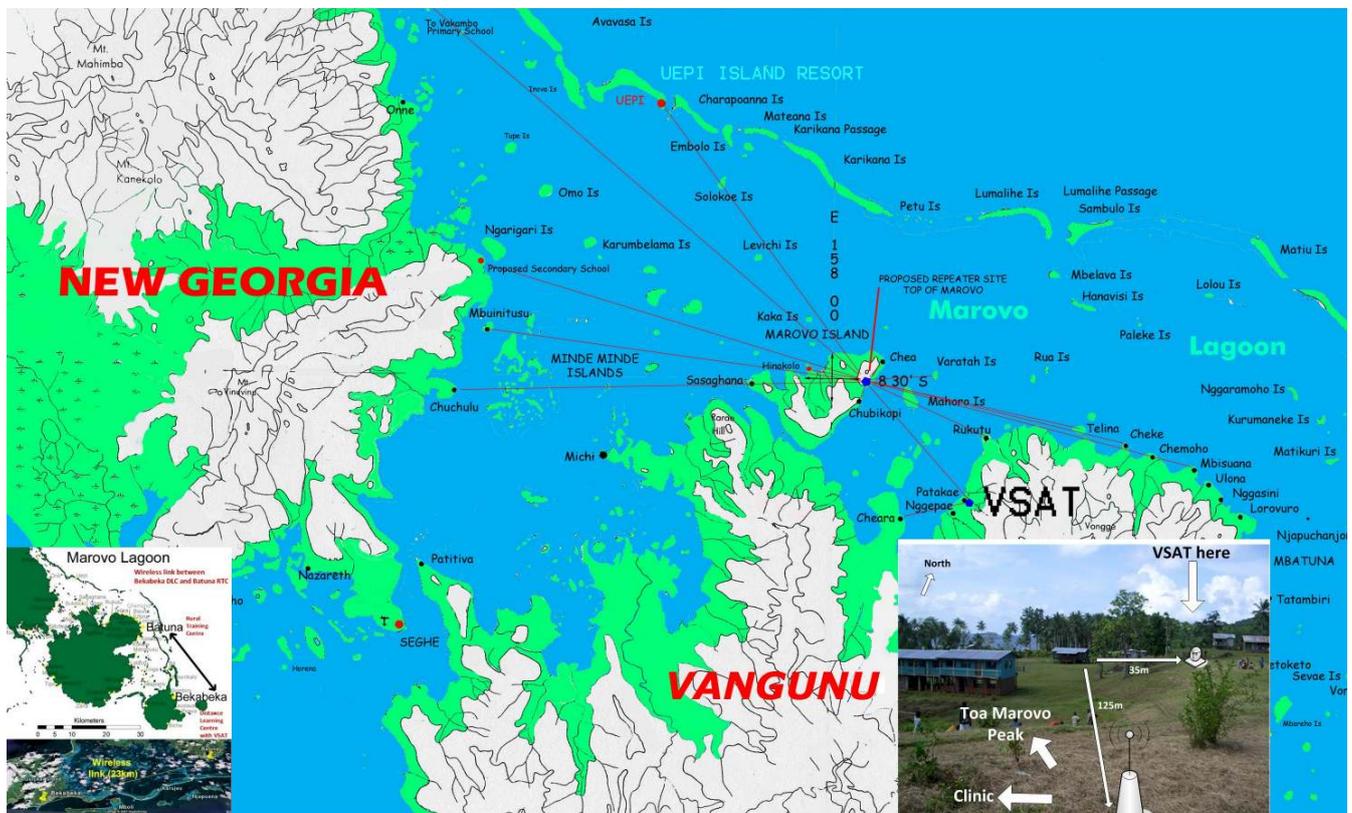
# ANNEX



The RICS VSAT at Patukae. This is solar powered and has been running since early 2008. The school computer lab is to be installed in the office shown, by Scots College. The OLPC school server will also be housed in the office.



The Wi-Fi mast at Toa Marovo. This is connected to the RICS via a bridge. It is solar powered, has operated autonomously for 2 years, and provides line-of-sight coverage with almost 360 degree view, to sites up to 40km or more. So far two villages, a resort and a clinic have been connected.



schools within the coverage of this network

## ANNEX

### PROPOSED EXTENDED CENTRAL MAROVO RICS / WI-FI NET

In May 2010, Brian Bird, Principal at Patukae CHS surveyed the remaining areas of Central Marovo, especially the area around Seghe, where there was no coverage from the Toa Marovo AP. Brian also identified suitable locations for a second VSAT (at Seghe Theological Seminary) and Wi-Fi masts and towers. He reported on this survey with a report showing digital photographs with indication of the technical location of the equipment. This survey was carried out at his own initiative.

### BEKABEKA DLC / MOUNT MARIU WI-FI NETWORK

In 2007, the DLCP project established a distance learning centre at Bekabeka equipped with VSAT, six public laptop computers, printers, scanner and projector, all solar powered. Later in 2007, DLCP extended the access to Batuna Adventist Vocational College (BAVC) using a 35km wireless link. External funds were used (GKP). The Wi-Fi tower was constructed on Mount Mariu. The GKP funds also provided for a small computer lab at BAVC. A local woman with good IT experience, Elnah Tati, took on the job of operating the facility. For a while her salary was paid by the University of Queensland's "Marine Biodiversity in Marovo Lagoon" project. Elnah also became a part-time local project officer for SPC when the OLPC project was launched.



Pictures of Bekabeka DLC in 2007/8. More on Bekabeka DLC: <http://peoplefirst.net.sb/DLCP/Western.htm>

Currently (Oct 2010) the Bekabeka DLC and Mount Mariu access point are no longer fully operational. Bekabeka DLC has a minor technical problem, most likely a VSAT cable. This is easily fixed.

The Mt Mariu Wi-Fi link is also not operational due to community disputes. This was due to Kavalovata Community disputing the ownership of the high-altitude location where the repeater mast was located with Peava Community, who had assisted in the project. Both communities see opportunity for connecting their villages from the repeater. An MOU was negotiated during 2009 but has not been followed through.

The Batuna computer facility is still functional but due to the link down, it has no Internet access.

## ANNEX



Wi-Fi antenna connecting Batuna to Mt. Mariu AP

On the left is an example of the low-cost Wi-Fi equipment needed to connect each school/community. If low-power computers (netbooks) are used, the solar power supply needed is also low-cost. The range is up to 50km as long as there is line of sight. (Toa Marovo has almost 360 degrees view of central Marovo). For locations only a few km away from the AP, even lower cost plastic antennas can be used. Note also that Uepi Resort is able to mobilise guests to donate equipment.

Break down of small community access facility costs (duty free, directly sourced):

- Wi-Fi antenna and router  
USD 500
- Netbook computer  
USD 500
- 130W solar panel, regulator and 250Ah deep cycle batteries  
USD 2,500

TOTAL (basic eqt): USD 3,500



(1) The community access facility at Batuna (connected to the Bekabeka-Mariu network) and hosted by the Batuna Adventist Vocational College. The Scots College volunteers will add something similar at Patukae.

(2) Students at work with laptops in Patukae school, 2010

# ANNEX

## REFERENCES

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[http://wikieducator.org/Community Media/Marovo](http://wikieducator.org/Community_Media/Marovo)