

Cyclone Damage Assessment Mission - Vatthe Conservation Area 7th - 13th March 1999

Draft Report

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1.0 Introduction

Cyclone Dani and cyclone Ella battered the northern island of Espiritu Santo early in 1999. Both cyclones were reported to have resulted in heavy rain and wind damage to the Vatthe Conservation Area. Charles Vatu, Conservation Area Support Officer estimated that about 20% of the rainforest trees in the CA were wind thrown and another 70% branchless. Damage to the ecotourism infrastructure, bungalows and trails and houses in both Sara and Matantas Villages were also reported.

SPBCP Officer, Francois Martel and Consultant - Sue Maturin visited the area for the week 7th - 13th March 1999. Sue Maturin returned to Vatthe with a tour group in June 1999.

This report presents our assessment of the damage to the Conservation Area – forest structure and trails, and damage to the eco tourism and project infrastructure, and recommends priorities for SPBCP support for the 1999 - 2000 work plan. Discussions were also held with leading members of both the Sara and Matantas communities to gain an appreciation of the communities perceptions, views and interest in the Conservation Area, and to identify community priorities for 1999 - 2000. To further assist in defining a list of priorities for the Vatthe CA for the 1999 - 2000 work plan, meetings were held with members of the CACC, the CASO and Project coordinator Russell Nari. The priorities and recommendations are incorporated in this report.

2.0 Tropical Cyclones at Vatthe

Dani tracked over the islands of Santo, Malo and Malekula on the 19th January 1999. Figure 1 shows the path tracking across Big Bay to the west of Vatthe. Storm to hurricane force winds of 55 to 65 knots was experienced. Dani was a very wet cyclone, bringing widespread flooding to many parts of Vanuatu.

A second cyclone passed well to the west of Vanuatu between the 10th - 13th February 1999. This brought little further damage to Vatthe.

Vatthe was also affected by a strong cyclone in March 1998. Cyclone Zuman did considerable damage to the forests of Vatthe, which was observed by Sue Maturin in June 1998. The forests along the nature trail were significantly damaged by Cyclone Zuman, with upwards of 10 large

gaps created by windblown trees. The trail was re cut to avoid most of the large fallen tree trunks, and crown debris, which littered the forest floor. The forest in the vicinity of the nature trails had changed from a cool dark dense forest, to a much more open forest, with large sunny patches. For much of the nature trail it was not possible to walk in the shade of the trees as it had been in the previous year. The fast growing *Merremia* vine, was not particularly evident in June 1998.

The Big Bay area was last hit directly by a cyclone, in 1977, by Cyclone Marion. Since then some minor damage may have occurred with Gordon in 1979, and Eric and Nigel in 1985.¹

3.0 Damage Observed At Vatthe

The nature and extent of the cyclone damage was subjectively assessed by viewing the forest with binoculars from the escarpment at the entrance to the Conservation area, walking up to the eastern escarpment along the Natora trail, walking the short nature trail and the trail to the large Nakatambol Tri. A quick assessment of regeneration was made, by examining several sites with extensive tree fall and noting the presence of canopy tree seedlings.

3.1 General Overview

To the untrained eye, it is not easy to pick up the cyclone damage to the forest from the views from the Escarpment at the entrance to the Conservation Area or from the Escarpment on the Natora Walk.

These important panoramic vistas are to the unseeing eye apparently unspoiled, and the damage will not be evident in photographs from these view points. An important factor as the image of a densely covered alluvial flood plain forest is one of Vatthe's selling points for both tourists and in the future, to potential donors to assist with the ongoing protection of biodiversity values.

Those with binoculars and who know what to look for are able to pick out the dead spars of trees drooping with the tell tale *Merremia* vines. These appear as spasmodic patches and are more prominent at the eastern area of the CA. This fact was borne out by a subsequent walk through to the Jordan River by Sue Maturin in June 1999.

3.2 Forest Condition

Once inside the forest the damage from Cyclone Zuman and Cyclone Dani becomes immediately apparent.

¹ Royal Forest and Bird Protection Society NZ, 1993. **Big Bay National Park Proposal and Opportunities for Sustainable Development.** South Pacific Regional Environment Program, Apia Samoa.

From my observations of forest condition in June 1998, it appeared that the majority of the tree falls and damage to the forest had emanated from the earlier Cyclone, Cyclone Zuman. Cyclone Dani has also caused some fresh uprooting of some large milik tri, (*Antiaris toxicaria*), nakatambols, (*Dracontomelon vitiense*) and blu wotas, (*Peterocarpus indicus*) as well as snapping crowns and branches. Some of the fallen trees and trees with their crowns snapped, were resprouting, eg bluwota and Nangalat, (*Dendrocnide sp*). These will eventually help reconstitute the former canopy. This process has been described as direct regeneration, and is a characteristic of forests where cyclones are frequent.² By the time we visited Vatthe in March some 2 months after Cyclone Dani, many trees that would have appeared leafless immediately after the cyclone were covered in fresh leaves.

Without undertaking an aerial reconnaissance or detailed transects it is very difficult to provide an estimated percentage of trees and forest area damaged. The cyclones have caused a large number of tree falls, maybe upto about 50 large trees, as a guess. A far greater number of trees have lost major branches from their crowns. It is likely that some of the damaged trees will succumb to pathogens or to competition from their neighbors and may die over the next few years. This will expand the gaps, and create more microsites for *Merremia* to invade.

The result of the three cyclones is that the forest canopy is much more open than it was prior to March 1998. This is evident walking along the forest trails, as it is no longer a dark cool shady forest.

The trails have been rerouted to avoid fallen trees, and often skirt around the root boles of fallen trees. These provide an interesting feature for the guides to explain about the various route structures, and could be incorporated into the guide commentary.

Several elders in Matantas feel very concerned about the rapid growth in “ropes” or vines, which could strangle the trees and ultimately cause more damage. *Merremia* vine is very evident in all the canopy gaps and is leaping from crown to crown. The trees that appear to be greatest effected are those with damaged crowns. The vine for the most part has not established on strong healthy trees. There is potential for significant long term damage, if the vines do strangle and kill trees as these will then fall over, creating a larger gap, and a new edge effect, so that over time the gaps will get larger and larger. According to Oostrom *Merremia* can smother trees or groups of trees.

At Vatthe we found some evidence of *Merremia* growing on the ground, and over fallen logs, in some places it dominated the gaps. In these locations it maybe that the vine will block out the light and suppress regeneration. In other areas the leaf litter and organic debris was prolific, and the vine growth minimal. Some regeneration of tree species is occurring in the gaps, most noticeable were rattan, which is prolific, *Ficus wassa*, *Myristica fatua*, Nakatambol, Stink wud, and *Adenanthera pavonina*. Stink wud and *Adenanthera* are pioneer species and it may be that there will be a compositional shift towards pioneer species in the gaps and a gradual re-formation of the original canopy, provided the vines do not prevent regeneration, and successive

² Peter Bellingham Landcare Research – Lincoln, New Zealand, Pers comm.

cyclones do not cause damage in the same gaps. Once a canopy is formed it is likely that the *Merremia* will be suppressed.

Merremia can affect regeneration. Applegate, (1992)³ in his study of rainforest regeneration in Vanuatu reported that “Observations elsewhere indicate that the vine will in effect smother any regeneration of commercial species in the openings created during logging.” Commercial species being largely white wud (*Endospermum medullosum*) and milik tri. There are no long-term studies of regeneration in Vanuatu. However observations are that although white wud is able to colonize disturbed areas it can do so only where there are relatively small gaps. In larger gaps, white wud is vulnerable to *Merremia sp.* In many locations in Vanuatu where *Merremia* is present regeneration of white wud is absent.²

During a study of the environmental impacts of a logging operation in Vanuatu, we found good regeneration of Bean Tree (*Castanospermum australe*) seedlings in the areas where Bean tri’s had been removed but where some of the canopy had been left intact. We found no regeneration in the completely cleared areas, which were covered in *Merremia*, grasses and *Solanum sp.* some 7 months after logging. We found some milik tri seedlings on the edges of the cleared areas, adjacent to or within the remaining stands of tall trees.⁴

There is observational and anecdotal evidence that many of the forest areas in Vanuatu which are frequently hit by cyclones, and/or have been disturbed by logging, end up as large areas dominated by *Merremia* vines with small islands of milik and other Canopy trees. The long term prognosis for Vatthe is unknown. Cyclones are probably an important part of the disturbance regime of the Vatthe Forests. The presence of dense stands of 20 - 25 m tall Melektri, Bean tri, Bluwota and Nakatambol over almost the entire flood plain are testimony to the ability of the forest to withstand many cyclones, and indicates that previous damage may not have been particularly wide spread.

3.2.1 Other Possible Impacts

Following a cyclone there is an immediate increase in the amount of debris, leaf litter, tree trunks and large branches on the forest floor. This was very evident at Vatthe. This fresh leaf litter has much higher nutrient levels than naturally senesced leaves, and may contribute a significant pulse in nutrient levels to the forest ecosystem. However fine root biomass can decline up to 75% over 6 months after a cyclone and so despite the apparent increase in nutrients, many of the surviving trees may not be able to benefit from it. The amount of coarse woody debris on the forest floor results in a substantial increase in decomposer activity that immobilizes nitrogen for several years after a cyclone. (Peter Bellingham, Pers Comm.)

³ Applegate, Grahame B., 1992: Rainforest Regeneration Study in Vanuatu. Queensland Forest Service, Atherton, Queensland.

⁴ Maturin, S.E., Clark, Andrea, & Salong, John, 1996. An Assessment of the Ecological and Economic Impacts of Logging Biel – Espiritu Santo – Vanuatu. Unpublished Report for IDEAS – Vanuatu.

New microsites for regeneration can be created as a result of the pit and mound topography and bare ground caused by the uprooting of trees, and the increase in light on the forest floor. Seed recruitment may also result from unusual flowering events that can occur after cyclones. These circumstances may allow species with specialized germination requirements to germinate, so increasing the species richness of the forest. There is very little knowledge about the long term impacts of cyclones on species composition in forests that are disturbed by successive cyclones.

3.2.2 Management Options

Cyclones are inevitable at Vatthe and the options for intervention to assist in natural regeneration or to attempt to control *Merremia* are limited and probably impracticable. Hand control of *Merremia* is difficult due to resprouting and rooting of stem fragments, and difficult access. The scale of the problem is such that it would require an enormous amount of hand labor that in reality is not available at Vatthe. Even if hand control was possible the impacts of further human disturbance to the ecosystem are not known.

According to Oostrom there are herbicides that are effective. These include; 2,4-D, Dicamba, Triclopyr, picloram and glyphosate. These would be expensive, and the potential environmental impacts would need to be thoroughly investigated before any decision was made to use chemicals.

The status of *Merremia* in the Pacific, is still being debated and it is not known whether it is a native or an aboriginal introduction. If it is a native then it is part of the ecosystem, and given that the area is a conservation area it is in my view desirable to let nature take its course. It would be useful to establish some long-term photo points to monitor the recovery of a number of the gaps, and to undertake an aerial survey to act as a baseline to establish the extent and health of Vatthe forest. These would provide a data base and enable long term trends to be assessed in the future.

Natural regeneration of the gaps would be enhanced if the bullocks and pigs were controlled. Pigs are likely to be greater problems than the bullocks as they can move around and penetrate the gaps easier than the bullocks. My general observation is that the amount of damage caused by pigs and bullocks to the Vatthe forests is increasing, and steps should be taken in the immediate future to severely reduce numbers of these animals.

From a tourism perspective the damage is not particularly obvious as by June the trails had been re cut to avoid most of the damaged areas. Canopy gaps were however regularly visible, either side of the trail, to those who were looking for them. My experience with this year's Forest and Bird tour party, was that they were interested in seeing first hand the impacts of a cyclone and learning about the effects of cyclones. Guides could make the most of the cyclone damage, showing the tourists the upturned root boles of different tree species, pointing out how different species respond to cyclone damage, eg some by resprouting from the base of broken trunks, others from fallen logs.

3.3 Impacts On Wildlife

In the time we had available it was not possible to make any meaningful observations about the impact of the cyclones on wildlife. There was some anecdotal evidence that more fruit bats and lorikeets were frequenting the gardens. This was noted but not raised as a big problem.

A study of the wildlife impacts of Cyclone Val, in Samoa⁵ found that many birds had declined in number after the cyclone, which caused severe damage to the forests. In many places less than 25% of the forest remained standing. Populations of pigeons and fruit doves were decimated, as these species rely heavily on fruits that were greatly reduced by the cyclone. Nectivorous and omnivorous species, (eg whistlers, honey eaters and starlings) also declined at many sites. Some of the insectivorous species such as fantails, robins, flycatchers and swiftlets increased as did those species that generally thrive in modified forests and open country. Increases in insectivorous birds are expected as it has been commonly observed that some herbivorous insect populations erupt after a cyclone following the initial plant regeneration. As a result insectivorous birds can become more abundant in the short term, (Peter Bellingham, Pers Comm).

My own observations of Vatthe in June 1999, were that the bird species we commonly hear at Vatthe appeared to be as common as I have noted in the past. We heard good numbers of all the pigeon species, fruit doves, fly catchers, fantails, robins, trillers, cardinal honey eater, golden whistler and cuckoo shrike. Rainbow lorikeets were common. We also observed megapode nests, close to Matantas. We did not observe any of the endemic white flying fox, (*Pteropus anetianus*), however we heard and saw reasonable numbers of Black Flying Fox (*Pteropus tonganus*). Very little is known about the fruit bat populations at Vatthe. During the 1993 Biodiversity Study¹ only two white flying fox were recorded. It is not known to what extent differences in behavior may influence the apparent abundance of the Black flying fox compared with the low numbers of the more solitary white flying fox.

3.3.1 Management Implications

From my general observations it does not appear that the cyclones have had significant impacts on the presence of common bird species as they were all still present. It is not possible to gauge whether there has been any impact upon population sizes or upon the less common species. Without baseline monitoring data it is not possible to determine impacts. Given that the population of the endemic White Flying Fox may not be very high at Vatthe, this species should be considered as a possible indicator species, which should be monitored.

Over the years since the establishment of Vatthe Conservation Area, some of the Matantas residents complain about the numbers of fruit bats that are frequenting their gardens. It is likely that the numbers of fruit bats feeding in the gardens will have increased immediately after the cyclone as the reduction in forest fruits will have left them hungry. Controlling the fruit bats is a management issue that should be addressed in the land use plan. Fruit bats are difficult to control, as they are intelligent animals. Killing individual trouble makers will not make any difference as more will return. Apparently fruit bats have the capacity to learn, and it has been

⁵ Tim Lovegrove, Brian Bell and Rod Hay, 1992. The Indigenous Wildlife of Western Samoa – Impacts of Cyclone Val and A Recovery and Management Strategy. New Zealand Ministry of External Relations and Trade. Wellington

suggested that a more effective method is to regularly hurt but not kill the trouble makers and this will eventually deter them from returning to the places which they associate with pain. (Pers comm - Michael Vardon, Wildlife Management International Pty. Limited – Darwin Australia.) My general observations are that the Black Flying Fox is not particularly abundant at Vathe and before any management regimes are established it would be useful to undertake a population survey of both the fruit bat species.

As I understood the management agreement established by the CMC there is a taboo on the hunting of all wildlife species. In the case of the megapode bird, this does not seem to be observed as during our June visit we noted one nest from which all the eggs had been removed. Flying fox and pigeon were also served in the restaurant. These species are important pollinators and seed dispersers and thus have an important role in the regeneration of the gaps. It is especially important now to ensure that the existing wildlife hunting taboos are enforced.

3.4 Nature Trails

3.4.1 Natora Walk - not damaged

This track winds up the escarpment to the east of Matantas village, and ends amongst a dense grove of Natora trees (*Instia bijuga*) with an overview of the village, gardens beach and most of Vathe's forests. The track is not damaged and the Natora trees all appear to be in good health. The extent of cyclone damage to the forests is not visible to untrained eyes.

3.4.2 Loop Nature Walk

This track was severely damaged. However by June it had been rerouted to avoid the majority of the fallen logs. The canopy in this area of Vathe has been substantially opened up and on sunny days, walking the trail can be hot for foreign visitors. Guides may need to be aware of this and make sure visitors wear their sun hats. Natural umbrellas should be cut and given to any who do not have a hat.

3.4.3 Nakatambol Walk

As with the nature walk, the forest on route to the Nakatambol tree has been extensively damaged. Much of the track has now been rerouted. The bamboo seating at the Nakatambol tree has been destroyed, and needs to be rebuilt.

The famous giant Nakatambol tree has been damaged. Several large branches in the Crown have been snapped. The *Merremia* vine has not begun to climb the tree. However the canopy surrounding the big tree has been opened up and there is now more light entering the forest floor which is resulting in a rampant growth of vines surrounding the Nakatambol tree. These will need to be regularly cleared. This area was cleared during our visit in March. On my return in June, a new white wud seedling, over a meter high had established here.

3.4.4 Jordan River Walk

The Jordan River has dramatically changed its course and now flows in a wide shingle bed, more to the west than previously. The river mouth has apparently also changed. The bar-b-q. house, and seats have all been lost, and not replaced. The swimming hole has disappeared and tourists now have to walk upstream to find a deep enough section of the river. It is now no longer possible to swim in the shallow fast moving river, but it is possible for the tourists to get wet. My June party was quite happy, except they did need somewhere reasonably comfortable to sit in the shade for lunch.

3.4.5 Management Implications

The tracks have been substantially rerouted to avoid cyclone damage and need no further work.

The seats at the giant Nakatambol need to be rebuilt. It would be preferable to also rebuild a shelter, seating and develop a bush toilet at the Jordan River. However the necessity for this depends on the level of demand for this tour.

The extent of the cyclone damage does raise some risk issues that need to be addressed.

During the 1998 Forest and Bird Tour, which followed Cyclone Zuman, we heard a number of large branches crash to the ground and two of my party were hit by falling boughs at the Nakatambol tri. Neither was hurt. There was quite a strong wind blowing at the time. At the Nakatambol tree it may be necessary to remove any dead trees or large rotten branches which could fall in the vicinity of the viewing area. There is a danger in doing this that other trees will also be damaged, only experienced tree fellers should be used.

There is a risk at any time that falling branches, or even falling dead trees may land on the tracks while people are walking them. There is a higher risk of this occurring following the damage caused by the last 3 consecutive cyclones. There are now many damaged trees in the vicinity of the trails and these may succumb to further damage by pathogens over the next two or more years. The tracks should be regularly inspected for dangerous trees. It is probably ecologically preferable that the track be re cut to skirt around any dangerous trees, rather than cutting the tree down.

It will be especially important to regularly check the site of the giant Nakatambol tree to make sure that the area is as safe as is feasible for tourists to congregate.

3.5 Bungalows

These were undamaged and remain in good condition. It is a testimony to the good design and strength of building, that the 6 traditional styled tourist bungalows withstood the cyclones.

3.6 Restaurant and Office

There has been some cyclone damage to a small portion of the roof, which has been temporarily repaired. It is not major and does not require extensive maintenance. The kitchen and office

floors were flooded during cyclone Dani, however none of the equipment or office paper work was damaged due to good preparedness.

There is some dissatisfaction with the restaurant. This centers on the constant rain of sawdust from the rafters onto the food severy and the tables. This has been temporarily solved by the erection of a large blue plastic tarpaulin suspended from the rafters, over the tables. However this also has the effect of reducing light from the solar lights, and detracts from the design and aesthetics of the building. It may be preferable to use locally stenciled or painted light colored fabric.

There was some discussion about the desire to rebuild the restaurant along similar designs to the Lonnoc restaurant, and in June I was told that they would like to have an iron roof on the restaurant. It seems that the problem with borer stems from the use of softwood for some of the beams and the fact that the thatch roof was not fired at the time of building. This means that the restaurant will have a much shorter life than would be expected.

There are a number of advantages to a tin roof, it would be longer lasting, and could also serve as a rain water collection catchment. However it would detract from the naturalness of the current structure, and would be less in keeping with the remainder of the structures and the predominance of traditional houses that surround the project house. My tour party was not enamoured with the idea of an iron roof.

3.7 Solar Power

This was not damaged as the correct precautions were undertaken. There was some concern that there was not enough warning of the cyclone so the precautions were taken after the cyclone had hit, this was due to people not hearing the radio reports. However the risk management that is in place for preventing cyclone damage appears to be adequate and Chief Solomon has been well trained. I did not ascertain if there are other people at Matantas who have been trained how to secure the Solar panels in the event of cyclones. If there are not enough trained people it will be important to train some more, in the event that Chief Solomon is not present when the next cyclone occurs. Prior to each cyclone season and during the season it is important to ensure that there is always someone present in Matantas who knows how to secure the solar equipment.

3.8 Water Supply

Water supply continues to be a major problem for Vatthe Lodge and the tourists.

The Geology and Drilling Section of Rural Water Supply put in a pump and well early in 1997. However the well silts up and the pump jams and the entire system is dysfunctional.

An alternative system was put in, during 1998. This involved the building of a small iron roof rain water catchment, which feed a water tank burried in the ground. A header tank was placed on top of a high tower. A hand pump was used to pump water from the ground tank to the header tank. A reticulation system using buried polyurethane pipes, served the restaurant, toilets and showers. There was enough water pressure to service the restaurant and toilets but not the

showers. Cyclone Zuman destroyed the roof catchment and the system broke down. It is not totally clear why the system was not rebuilt as the tower and the reticulation system remains intact. Instead of repairing the system, the ground tank was dug out and a new shelter was built behind the toilets. There were some complaints that the hand pump was hard work and they could not fill the header tank.

During my visit in June water was trucked from the Matantas River for use in the kitchen and the toilets. Only one of two tanks was connected to the roof catchment, and this was used solely by the tourists for drinking water.

The current rainwater tank capacity is not sufficient to cater for tourist needs during the dry season, or when as has happened this year, there was no rain for a month. During this month water for cooking was obtained from the Matantas River.

The 1998 Forest and Bird tour party donated 7 solar shower bags that work well, and my party found them to be sufficient. Unfortunately the shower buildings were designed for the reticulated shower system and it is not possible to hang the solar showers at a good height. This could be remedied by redesigning the roofs and building a strong attachment point.

Charles Vatu reports that “The Canada Fund” may be willing to develop a water supply system. Preliminary discussions focus on locating large rain water tanks on the escarpment to the east of the village to provide enough head for a reticulation system. They are waiting to receive a feasibility study. CHECK WITH CHARLES.

There may be other options that should be investigated. These include building a sufficient rainwater catchment system, installing a new large water tank, placing the header tank on new shorter stature platform, than the one that currently exists and installing a solar pump to pump the water to a header tank.

A flush toilet system with septic tanks has been installed. These require substantial amounts of water, which may not be easily available. An alternative dry system could be investigated if it is found that water availability is a problem. Appendix ??? provides information on a system being trialled in Papua New Guinea and Australia that sounds promising.

There is an urgent need to investigate the requirements for water, both for the tourists and the village and to identify possible supply and reticulation options and prepare a feasibility study.

The lack of an adequate water supply is holding back the development of the ecotourism business, and will be effecting the number of tourists who venture to Vathe.

3.9 First Aid Post

The First Aid Post was unaffected by the cyclones and remains in good condition.

3.10 Other Community Infrastructure at Matantas and Sara

A small number of houses at Matantas received some damage, mainly to their roofs. These have now been repaired. The Bahai School was severely damaged and is now being rebuilt. In the mean time the old kindergarten building is being used. The Seventh Day Adventist Church was destroyed. A temporary shelter has been erected.

At Sara a small number of houses were also damaged, but we received no reports of further damage to community infrastructure.

The road to Matantas is deteriorating but suffered little damage from the cyclones and remains passable by mini vans.

The Gardens at Matantas suffered, and most crops and fruits were decimated. Pomplimous were in good supply, but there were no bananas or paw paw. The yam crop was destroyed, but manioc, kumala and taro were still available. In June most of the vegetables supplied to the Lodge were obtained from gardens at Sara. The Sara gardens also suffered and most people lost their yam and banana crops.

4.0 Community Perceptions of the CA Project

From my discussions with most families in the village I gained the impression that there was widespread approval of the project and an appreciation of some of the benefits that were starting to flow. Most frequently mentioned was the improvement in health particularly a reduction in upset stomachs amongst young children which was attributed to the improvement in the availability of rain water supplies brought about by the building of the large tank through the National Council of women. The existence of the First Aid Post was also frequently sited as a major improvement.

Several teenagers that I interviewed, mentioned the hope that they would be able to return to Matantas after finishing school and work for the lodge. Parents also mentioned this hope for their children.

There was widespread pleasure that tourists were starting to come, and an appreciation that this was bringing small vatu to many families.

Many families commented that the greatest benefit was the settlement of the dispute between Sara and Matantas and the fact that the two villages were co-operating and working together on the project was perceived as a great advance and contributed to a reduction in the tension in the village.

4.1 The Tourism Venture

Underlying the positive perceptions about the overall project is a serious resentment between several key families and the managers of the lodge to do with the distribution of vatu arising from the tourists. This erupted into a major conflict that resulted in a long village meeting during the time of this consultancy.

I spoke with several of the key families who felt that most of the financial benefits of the project were going to the managers of the lodge. These families seemed to have little understanding of how the lodge was run, what was involved in terms of the expenses. They perceived that the tourists were bringing in lots of money but they were not seeing very much of it.

They thought that paid work associated with the running of the lodge was concentrated too much in one family and was not being fairly distributed amongst the other families. One family felt that one of their members should be receiving training so that he could manage the lodge. There was also a feeling that the lodge was not purchasing enough produce from the Matantas families. The families wanted to charge the same price for produce as in the Luganville markets and felt that the Lodge Managers were not paying them enough.

One of the key families was quite happy with the Lodge Management, as they were being paid for food they produced and they also worked around the Lodge.

From the Lodge Managers perspective they felt that they had tried everything possible to encourage these families to become involved with the project. Particular people had been invited to work along side the managers so they could receive on the job training, but no one had taken up these offers. The managers felt that they had tried to buy produce and food from Matantas people, but they wanted to charge too much for the products and they were often unreliable in providing the products sought. They also believed that they had tried to employ other members of the community but they were often unreliable and would not turn up for work when needed. The managers perceive that they have contributed hours of voluntary work to the project and that they receive little or no help from the rest of the community.

Since this consultancy there have been a number of village meetings to discuss these issues and it appears that many of them have been resolved. As I understand some of the resolutions they involved: CHARLES AND RUSSELL ARE THESE RIGHT?

- The lodge managers reasserting their invitation for people to work along side them with the aim that when they take holidays these people will take over managing the lodge.
- Hiring more people outside of the lodge manager's family.
- Purchasing more produce from Matantas and Sara
- Setting up a tourism management committee to oversee the budget and financial accounting of the tourism business.

Chief Moses raised a concern about guide training. He felt that the guides received too much outside training and did not pay enough attention or respect to Kaostom knowledge from their elders, especially about medicines and the use of various trees by various birds.

4.2 My Personal Perceptions

The tourism project remains very dependent upon the dedication and motivation of one particular family who have developed excellent management and organizational skills in hosting tourists. They have a large family, all of whom are motivated and capable of working with the tourism project. Unfortunately there are no obvious people in Matantas who have the motivation or the level of schooling necessary to undertake training to take over the management of the lodge.

I am not familiar enough with the people of Sara to know whether there may be other potential lodge managers at Sara.

The long term sustainability of the project is very dependent upon the Tavue family and it may be necessary to make greater efforts to identify other long term Matantas or Sara residents who have an interest and a potential ability to manage the lodge and to ensure they receive adequate on the job and professional training.

There are a number of ways in which the families of Matantas and Sara could receive greater benefits from the project. These include the provision of eggs and chickens, which are largely purchased from Luganville as there are not enough in Matantas or Sara and only one family at Matantas has a chicken coup and is regularly producing eggs. When I raised this as a proposition to some of the families they said they did not know how to raise eggs in a coup nor did they have any vatu to build a coup. It may be useful to assess the level of potential interest in such a venture and run a workshop on poultry farming.

Another opportunity is for families to make jams and chutneys from the produce from their gardens. Pomplimous are in good supply and it should be feasible to make marmalades for sale to the lodge. Paw Paws, are usually in good supply and paw paw jam could also be made for sale. The women said they knew how to make the jams out of limes, naous, pomplimous, paw paw, pineapple and tomatoes, as the National Council of Women have run a workshop teaching jam making. However no one had thought of making them to sell to the Lodge, neither had the lodge managers approached them with the suggestion. In this case it is probably a lack of motivation rather than a lack of skills.

Another potential small scale venture is the provision of nuts and dried fruits as snacks for sale to the tourists, or to the lodge. This would require a small scale feasibility study and some training if it were considered to be feasible.

During our June tour it was apparent that a number of changes had occurred as a result of the village meetings. More people outside of the lodge manager's family were working in the tourism venture, cleaning the bungalows, serving the tables, and cooking. Just about every family in the village contributed precooked dishes to the Island Night feast. As much of the produce as possible had been bought from Matantas or Sara, including the fish. Each of the two previously feuding string bands performed on different occasions. The whole village turned up to watch several of the performances, notably Margaret's dance and games and the Talatas Kaostom dance.

There is still some suspicion about where all the money from the tourists goes. I believe it would be useful to have a work shop where all the financial transactions associated with the lodge and tours are clearly explained and demonstrated so that everyone has a good understanding of the expenses of running the lodge. This needs to go beyond the tourism management committee, the CACC and it should include the youth groups.

The Tavue family suggested that the tourism business could be expanded by building a conference center and using Vatthe as a training center. Government Departments have expressed an interest in using Vatthe, as it is remote and removed from alcohol and other temptations. Various work shops have visited Vatthe over the last two years and there may be potential to develop this, it seems a logical extension, especially for hosting environmental workshops. A feasibility study would be necessary.

4.3 Alley Cropping

The demonstration alley cropping gardens have not been maintained. Four landowners started alley cropping gardens but lost heart after the dry season when the sun was too hot and burnt most of the crops. Yams and some crops have been harvested but only yams and some bananas continue to be harvested. The landowners reported that there was little difference between the amount harvested from the traditional gardens and the alley cropping gardens, but that alley cropping required more labor. One garden got a fungus infection so it was abandoned. It was observed that similar fungi also cause problems in the traditional gardens.

The Tavue family have established a small alley cropping garden (15m x 8m) close to the bungalows to supply vegetables to the lodge. This is being carefully tended.

It appears that other than the Tavue family, none of the families have adequately understood the techniques nor do they perceive the need to change from their traditional garden techniques. It is clear that they were not given enough advice about protecting crops from the sun.

The full extent of the garden area is visible from the escarpment overlooking the village. It is clear that there will in the near future, be a land shortage for gardening unless fresh inroads are made into the conservation area. This encroachment is already beginning. A new garden area has recently been established inside the conservation area and gardens are gradually extending from the village on the forest side of the road.

Most of the families are continuing their practice of planting coconuts on their old garden sites, thus necessitating new areas to be cleared, further and further away from the village.

The original concept for the alley cropping project was that a member of the Farm Support Association would spend considerable time in the village working alongside the families who had undertaken the experiment. From my understanding this did not eventuate and the Matantas families did not gain enough knowledge or confidence in the new techniques.

I believe that there is an urgent need to get this aspect of the project up and running again. For this to happen there has to be a much better perception of the need for it and this needs to be part

of the development of the resource management plan, and incorporated into a conservation awareness program. Once there is a better perception of the need for alley cropping it may be possible to identify an interested and motivated family and employ a part time person to teach and demonstrate alley cropping techniques.

4.4 Nut Harvesting

Guilhem Maistre – Pacific Nuts Ltd in Luganville, has begun cracking, vacuum packing and selling Nangai nuts. His products have been certified as organic products by AGROW in New Zealand and he is now attempting to have them certified in Europe. Guilhem is currently selling in Luganville and Vila and exporting to France and is not able to obtain enough supplies. It is thought that the EL Nino, La Nina oscillations have an impact of fruiting, and but this has not been researched. He has no interest in other nut species. Navele has a problem with cyanide in some varieties, and there is no cracking mechanism available for Natapoa

Between September 1997 and January 1998 he purchased around one tone of nuts from Matantas at 30 vatu per kilo. He was uncertain as to why there had been no nuts for the 1998/99 season, but attributed it to a rumor circulating in Matantas, that he no longer sold nuts.

According to the families at Matantas they realized they had received good money but they were unsure of the harvesting procedures and thought that they had to crack them. Nearly every household had collected nuts last year. There was also a perception that the bats were ruining the nuts. However bats are not able to ruin mature nuts as they can not break the seeds, they can however cause problems before the seed is properly formed.

It appears that there is potential to harvest nuts, and the current lack of harvest is possibly the result of communication failures and a lack of understanding. This could easily be overcome by running a workshop with Guilhem Maistre. He indicated that he would be willing to run such a work shop.

Francois Martel raised the possibility of creating a regional certification system for products produced from Pacific Conservation Areas. This would enable places like Vatthe to earn a premium for the production of nuts.

4.5 Conservation Awareness

From my discussions with individual families at Matantas it is apparent that there is very little general conservation awareness and understanding about what the Conservation Area really means. The project to date has focused on the community development aspects and establishing the tourism business. However amongst individual families there is very little understanding of the concept of conservation, and sustainability, nor of the linkage between the CA and the tourist ventures.

If Vatthe is to continue to be protected after the SPBCP funds have ceased it will be vital that the whole community of Sara and Matantas have a much greater appreciation of both Kaostom and new conservation principles and management.

5.0 Community Perceptions of Work Plan Priorities

A CACC meeting was held at Matantas to discuss priorities for the 1999/2000 work plan. The CMC is concerned about ensuring the sustainability of the project once current funding ceases. They note that tourists are coming but they are not enough to sustain the project.

The most urgent problem perceived by the CACC and Lodge Managers, is the need for a water supply for the tourists.

Other matters raised included:

- The need to improve community participation
- How to use and protect the wildlife, existing taboos are not respected
- The need for the CASO to have a house at Matantas
- Need for a resource management plan, because it is not clear now and every now and then people go in a clear or take something from the forest.
- Pigs and bullocks are damaging the forest
- Need to do something about the vines which are spreading
- How to solve the problems with bullocks and pigs in the gardens
- The guides need to be better trained as they have received some complaints from tourists. They need to understand more about the needs of different kinds of tourists.
- Need to do more marketing to get more tourists, especially groups.
- Need to have a replacement for Charles
- Need for other income - not just tourism.

We had a small meeting with the Vathe landowners from Sara, Chief Lus, Joseph and Waasa. During this meeting the following matters were raised:

- Sara would like to develop a tourism project focused on a garden tour, and visit to a World War II plane wreck. This would also necessitate the development of a water supply
- Sara would like to develop a Nakamal as a training place.
- There is interest at Sara in nut harvesting.

- The Sara landowners believe that the boundary of the Conservation Area must be marked out.
- There is concern that the existing management agreements and taboos in relation to the use of wildlife and encroachment of gardens into the forest area are not being honored.

We also interviewed Russell Nari - Project Coordinator of the Environment Unit in Port Vila.

Russell identified the following priorities;

1. Identifying other income generating activities and undertaking relevant feasibility studies.
2. Designing and implementing a transition strategy to ensure the future success of the project once funding ceases. the strategy needs to deal with management structures and ongoing resource management.

5.1 Recommendations for Work Plan 1999 – 2000

The following list of priorities for the 1999 – 2000 work plan arise from the discussions we held with the CACC, the landowners of Sara, key families in Matantas, Charles Vatu – CASO, and Russell Nari. With the exception of the need for a water supply which is urgent and a top priority all the other recommendations are considered to be of equal importance. Those that are marked with an asterix will require SPBCP funding support.

- * Assessment of water supply requirements, options and preparation of a feasibility study. Funding for the installation of an appropriate water supply system may need to be sought.
- * Assessment of opportunities for other income generation, preparation of relevant feasibility studies, and provision of relevant training for establishment of feasible options.
- *Preparation of a 10 year tourism business plan and budgets to include; provision for ongoing maintenance and replacement of tourism infrastructures, Luganville office requirements to facilitate lodge and tour bookings, a regional and international marketing strategy, feasibility of utilizing Vatthe as a training center, development of tour packages.
- * Tour Guide training. The existing guides require further training to develop their interpretation skills, improve their kaostom knowledge and skills in handling tour groups and differing nationalities. Ideally more guides should be trained.
- *Funding for workshops on nut harvesting.
- *Aerial photography to assist in the delineation of CA boundary, preparation of resource use plan and to provide base line data for long-term monitoring of forest health, and landuse

patterns.

- *Preparation and implementation of a resource use plan, including workshops to raise conservation awareness.
- Revitalize alley cropping trials.

6.0 Summary of Recommendations re Restoration of Biodiversity Values, and Tourism Infrastructure following Cyclone Damage

Biodiversity Values

1. Clear *Merremia* vine from around the giant Nakatambol
2. Allow damaged areas to naturally recover.
3. Take urgent steps to reduce the number of pigs and bullocks, and maintain them at low numbers.
4. Enforce agreed taboos on the harvesting of all wildlife with the exception of the pigs and bullocks that need to be reduced.
5. Establish a series of permanent photo points in a range of gap sizes to record long-term vegetation cover trends.
6. Establish a locally based monitoring program for key wildlife species, bats, pigeons and megapodes are suggested.

Forest Tracks

1. Rebuild bamboo seats at the giant Nakatambol tree
2. Regularly check tracks for damaged trees that may be dangerous to passers by and reroute tracks if necessary.
3. At the giant Nakatambol site regularly check for damaged trees and branches that may be dangerous to visitors to the site, and remove if absolutely necessary.
4. If there is a tourist demand for the Jordan River walk and bar b q, build seating and a shelter and a bush toilet. The toilet should be located well away from the river and the eating area.

Project Infrastructure

1. Repair damaged restaurant roof with traditional materials
2. Create an attractive stenciled or printed canopy to catch the sawdust to replace blue plastic tarpaulin.

3. Continue to ensure that there are water tight plastic containers available at all times, in which to store all office and project paper work in the event of further cyclones.
 4. Determine if there is a need to train more people in cyclone preparedness in relation to protecting the solar power system and other tourism infrastructures, and carry out appropriate training.
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