

THE ROLE OF A FIJIAN COMMUNITY IN A BIOPROSPECTING PROJECT

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For thousands of years our ancestors have lived off an ocean whose reefs have been and still are home to a wide range of marine life. Our affinity with the land is, therefore, not merely land-based, but literally extends beyond our shores to encompass the ocean and the reefs that surround us. The reefs are part of our vanua, our identity as a people, and it is an essential element that ensures our very survival as i taukei. Without our reefs, we are sunk in every sense of the word.

As major international corporations search for supplies of coral, they look to countries like Fiji, where there is little or no protection for the resource owner, the i taukei ni qoliqoli. Their resources are slowly being depleted, and while these major corporations make millions out of coral, the i taukei receive very little compensation. Logically, they really should be some of the wealthiest people in the country. –Prime Minister Sitiveni Rabuka, at the Launching of the Pacific Year of the Coral Reef Campaign.

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Overview

During the colonial era in Fiji, the rights of native Fijians were taken into consideration to a greater extent than in many other colonies. As migrants from other countries and laborers primarily from India moved in to Fiji, a large proportion of the land was reserved for the indigenous Fijians. This land could not be sold or otherwise permanently alienated. As a result of this policy and the continuity of local political structures, indigenous Fijian villages have deep social and ecological grounding. There is a tremendous sense of place.

Landowning *mataqali* or family groups continue to manage lands in their territories, and often that control extends as far into the sea as local boats can go. Government consults with chiefs on fishing licenses and other permits for use of the resources, and outsiders pay leases to the *mataqali* for such uses as hotels, dive areas, plantations and even access roads.

The picture is not totally benign, however, with respect to biodiversity conservation. While the forests and coral reefs of Fiji house many plants and organisms with medicinal potential, there are both internal and external pressures on these resources. Internally, the population grows and intensifies resource use for commercial and subsistence purposes. Land leases and extractive licenses are a source of income for the *mataqali*, but lessees do not have incentive to conserve. Waste disposal is a problem. Externally, industries such as logging, coral harvesting and mining encroach on the land and sea resources. From the quote above, one can see that the Fiji government is concerned that communities are not getting a fair share of the revenue from these extractions.

Conservation groups seek ways to help communities to husband their biodiversity in the face of these pressures. These groups know that it is not enough to tell people to conserve. There must be incentives, coupled with awareness of the benefits of conservation. As many of the pressures revolve around increasing commercialization and need for cash, enterprises that generate cash benefits to communities are often part of incentive packages. But community-based enterprises such as small-scale ecotourism and the processing of forest products are risky endeavors with steep start up and maintenance costs.

What are some less risky ways to generate benefits that could provide incentives to conservation? If set up in an ethical way in partnership with a reputable company or research institute, bioprospecting offers an attractive alternative: an enterprise that carries little risk to the communities and offers fairly substantial cash benefits. The incentives to conservation include not only the cash from sample fees—and potentially from medicines produced from the samples—but the increased awareness of the value of biodiversity as a result of the prospecting. Community members can be trained as sample collectors, processors, to and monitor populations of key species.

Within the bioprospecting partnership, the institutions shoulder any financial risk. In addition, there is usually not a heavy time outlay involved so that community members do not risk losing time away from other important activities. An added benefit is that, further down the line, communities can use cash benefits to finance other enterprise or conservation activities. The skills used can be transferred to other resource management and research and extension functions.

Despite these benefits, many community activists and scholars express profound concern about bioprospecting as an appropriate venture for communities. These concerns center on the intrinsic inequality between a community and a large, profit-making corporation as well as the difficulty of figuring out the magnitude and distribution of benefits. As some bioprospecting ventures involve the identification of bioactive species based upon local knowledge, there is worry that intellectual property rights will be respected and rewarded.

There are other downsides to bioprospecting, inherent in the nature of the enterprise. For one, short-term financial benefits from sample fees are not sustained for very long—there are a limited number of samples that can be obtained from any one site.² Second, while there is low risk, there is also little investment in the community in terms of infrastructure. Finally, the *per capita* magnitude of benefit may be quite low, too low in fact to present an attractive alternative to extractive activities.

This case study illustrates how a bioprospecting venture, informed by the concerns expressed above, sought to work with a community in Fiji to maximize the economic and conservation benefits. A key feature of this story is the determination of the main partners to work patiently through each step of the process and retain a vision of an equitable bioprospecting agreement with long term benefits for all partners. One result achieved already is significant advance at the national and institutional levels in policies about bioprospecting. Another is the boost given to ongoing conservation and development initiatives in the community.

The case study first describes the bioprospecting project in general, then briefly depicts the community and the site. The next section focuses on project activities with the community, including resource management workshops, relations with community residents living in the capital, and biological monitoring activities. It describes how community leaders were trained in monitoring and gave a presentation on their program at an important international conservation conference. The study concludes with future activities planned for the project and the community.

The Project

Since the University of the South Pacific (USP) was founded in 1968, one of the main research areas of its Chemistry Department has been the isolation of natural products from plants used for medicinal purposes in Fiji. These efforts have been hindered by lack of scholarships for postgraduate research students and dependence on informal contacts in developed country laboratories for spectra required for structural determination and for evaluation of biological activity. A number of overseas researchers made large-scale collections of plant and marine organisms in Fiji. Usually ostensibly for "academic purposes," these samples often ended up being tested by large companies for possible commercial development. In most cases, this work was done with minimal, if any, USP involvement.

² Recollection, milestone fees and of course potential royalties could bring benefits down the line.

In 1995, USP applied for and received a planning grant from the Biodiversity Conservation Network (BCN). BCN is part of the Biodiversity Support Program (BSP) consortium of World Wildlife Fund, The Nature Conservancy and the World Resources Institute funded by the US Agency for International Development. With funding from the BCN grant, and a close partnership with a pharmaceutical company, USP planned to expand work into the marine area and upgrade its facilities to add value to local samples before they were sent overseas.

From the outset, the developers of the project saw bioprospecting as a means for furthering community development and community-based conservation as well as scientific knowledge. Due to the range of biodiversity and interest in conservation, one coastal community, Verata, and one rainforest community, Namosi, were chosen as source areas. Traditional leaders in both areas were recent graduates of USP and had expressed concerns about environmental threats: overfishing in Verata and logging and mining in Namosi.

Finding a pharmaceutical company partner was at first relatively easy. USP approached Dr Brad Carté of Smith Kline Beecham (SB) who had been collecting marine samples in Micronesia. Dr Carté's professional reputation, his interest in equitable benefits for source countries, and his emphasis on the marine environment that is so important to the Pacific region made collaboration with him and SB attractive. He responded positively to the request that SB extend its work to Fiji.

The discussions leading to the development of a bioprospecting agreement began in a virtual policy vacuum. None of the parties involved—USP, SB and the Fiji government—had any stated policy on bioprospecting. These institutions realized the benefits of using their involvement in the BCN project to develop such guidelines. The development of these policies was aided by a growing literature, including *Biodiversity Prospecting* put out by the World Resources Institute in 1993, and a number of position papers by Sarah Laird and others.

The original discussions on if and how bioprospecting could take place in Fiji were held with the Environment Department. Fortunately, a bright young scientific officer, who also happened to be from Verata, was in charge of these talks. He called together a working group from relevant government ministries that set the parameters for this particular project and eventually for bioprospecting in general in Fiji. Government ended up choosing a regulatory role to define the approval process and also to ensure that the rights of communities were protected.

After the national government approved the project, USP and its partner non-governmental organization (NGO) the South Pacific Action Committee for Human Ecology and Environment (SPACHEE) approached the provincial governments for native affairs with jurisdiction over Verata and Namosi. In both cases, the heads of the provincial government were also traditional leaders and had close connections with USP. Once these leaders were satisfied with the proposed activities, they arranged for someone to accompany the USP team to the villages. In Fiji, the indigenous people own the land,

traditional authority is respected, and government is seen as protecting traditional rights. Thus following traditional protocols made approval for bioprospecting by the community very likely.

The next step was the development of the formal bioprospecting agreement. Brad Carté suggested that the project team recruit Charles Zerner, leader of the Natural Rights and Resources Program at Rainforest Alliance, to advise on equity issues. Zerner in turn advocated bringing in Michael Gollin, a leading authority on bioprospecting contracts. In October 1995, USP, SB and other members of the project team met with a representative of the Fiji government and the Verata community.³ Mr Gollin acted as facilitator and the Worldwide Fund for Nature/South Pacific (WWF/SP) agreed to act as rapporteur. Mr Gollin had earlier prepared a questionnaire for stakeholders asking what they wanted from the agreement and any constraints they felt in joining it. For the meeting, he drafted an outline document based on responses to the questionnaire. The meeting was unusual in that it was held in the source country and open to a variety of stakeholder representatives.

One of the first points of discussion was whether there would be a three-way agreement between SB, USP and Verata or whether separate SB-USP and USP-Verata contracts were preferable. People concerned about conservation and community rights believe that contracts that involve the communities as equal partners are preferable as they recognize the crucial role of communities in conservation of resources, knowledge and national development. The drug companies, however, have legal constraints to only pay benefits to legally constituted bodies. This issue was not fully resolved during the meeting. The absence of any firm policy by SB and USP also created difficulties as on some issues no final stance could be given by the representatives at the meeting.

By the end of the week, the parties reached agreement on most points and participants were left with issues that needed to be resolved at a policy level. SB was to write a final draft of the agreement to be translated into Fijian for conclusive discussions with the communities. The BCN grant included funds to pay the costs of legal representation for the communities to review the contract.

In April 1996, SB closed down their natural products discovery division.⁴ USP immediately began a search for another partner. The project was already into its first six months of implementation. The project team felt that an institution that acted as a broker would most likely be able to enter an agreement on short notice, and so they contacted the Strathclyde Institute of Drug Research (SIDR) at Strathclyde University in Glasgow, Scotland. SIDR was at that time in the process of signing an agreement with a Japanese drug company to provide 5000 samples, and so they were quite keen to become a partner. Strathclyde's agreements provide 60% of all funds obtained from licensing samples to the source country. Although they retain a substantial 40%, there are several advantages to this type of arrangement:

³ Due to US budget cuts the project had to be cut back to only one community as described below.

⁴ Dr Carté is now based at Singapore University and plans to collaborate with USP in the future.

- SIDR has greater credibility and negotiating power compared to a developing country institution and thus can obtain higher fees from drug companies. As an example, SB had agreed to pay USP US\$100 per sample, while the sample fee in the SIDR agreement comes out to US\$200 (as 60% of the total fee).
- Because they share fees with the host country institution, SIDR is a partner in the bioprospecting. It is thus more likely that they will represent the interests of the source country. This kind of agreement is different from negotiating directly with a drug company, which must place their profits first.
- Although in both cases the primary discussions were held with a concerned scientist, the SIDR scientist had greater influence with the legal department of the organization compared to SB.
- Bioprospecting partners such as the government, NGOs and community groups perceive that an entity associated with a university will be more likely to honor its contractual commitments than a large multinational drug company.
- The 60:40 split compares favorably with that offered by other collectors/brokers, which may be as low as 10:90. The Manila Declaration of the medicinal plant scientists in Asia/Pacific calls for at least a 50% share of sample fees to be retained for the source community.
- It is possible that SIDR can license the samples to other companies once the original licensing period expires, thus increasing the benefit.

The main disadvantage of SIDR over SB was that perhaps SB was in a position to provide a greater range of in-kind benefits such as preparation of a manual of marine biodiversity, training for USP researchers, and possible contributions to a community fund. There are no in-kind benefits from the drug company to SIDR. SIDR does offer to provide assistance in scientific work to USP, but not to communities. Another limitation to dealing with SIDR is that all contracts have to conform to the contract between SIDR and the drug companies. For example, it is considered best practice to give the source community prior informed consent on the possible commercial development of a product based on their resource. Within the SIDR framework, SIDR guarantees the right of commercial development to the drug company partners, so prior informed consent of the community is not possible.

SIDR has a simple pro-forma contract that was used as the basis of the USP agreement. They preferred to contract directly with USP and have USP contract to communities. As samples may eventually be provided from communities other than Verata this contract allows USP greater flexibility to work with different communities. The principles that had been established in the SB draft contract were then used to suggest changes and additions to the contract. A revised document was then distributed to stakeholders and the Rainforest Alliance reference group, a group of international experts in bioprospecting.

The draft contract received extensive comments and suggestions which, wherever possible, were incorporated into the final USP/SIDR agreement.

An associated USP/Verata contract was subjected to the same process and translated into Fijian. This contract has been reviewed by a community lawyer who, partly because of her involvement, is now also the Fiji focal point for Article 23 discussions on protection of intellectual property rights (IPR) under the Convention on Biological Diversity. Except for the possibility of joint ownership of any commercial products under collections in Verata and recognition of community stewardship of the resources, IPR issues are not part of these contracts, as the collections are not based on traditional uses. The communities are advised that they can request that certain plants (for example, of special medicinal value to them) not be collected under terms of this contract if that is their desire.

A key feature of these contracts is that a small amount of sample is licensed through SIDR for a limited period (usually one year). This sample remains the property of the community and if not under a licensing agreement can be reclaimed by the community. These agreements set out a broad definition of sample to include derived chemicals and products. They also give Verata first right for recollection and provide for appropriately qualified people from Verata to be employed by the project.

Because USP currently covers its collection costs with the BCN grant, all royalty fees are passed on to Verata. Collection and processing fees come to about \$20 per sample, while the cost of machinery used in the grinding of material and extraction comes to about \$5,000, or an additional \$10 per sample for 500 samples. Under the agreement, the division of royalty benefits will be set within two years. This timing allows further discussion in Fiji and the rest of the Pacific on how benefits can be most equitably shared and best used for conservation and development.

Although this bioprospecting process is perhaps unusual in that it has been supported by outside funding, many of the lessons learned are widely applicable. Perhaps the most important lesson is that the agreements should not be confidential. This openness allows wide international advice on whether provisions accord to best practice or not. It is very useful to have available a register such as the RA reference group, people with experience in negotiating these agreements who are willing to offer advice on draft agreements.

Verata

The USP-BCN project proposal originally sought to involve two Fijian communities in the bioprospecting activities: Namosi in a rainforest area, and Verata on the coast. When the project budget was reduced, the project was only able to work in Verata, although the idea of involving Namosi has not been forgotten. This section describes some of the key activities undertaken with Verata people during the life of the project, and how the community has come to view bioprospecting and other environmental issues. It focuses on the role of community leadership in Verata in mobilizing not only its own community but serving as a model for others as well.

Verata is a *tikina* or county comprised of eight villages within the province of Tailevu, on the eastern shore of Viti Levu. It is a highly important locale in Fiji, being one of the first sites where Fijians consider their ancestors to have settled—the equivalent of Plymouth Rock in the United States. The chiefly families retain great prestige, and Verata people maintain ties to many other *mataqali* throughout the land. Activities carried out in Verata thus have resonance throughout the country. In addition, Verata is not far from Suva, so there is very active participation of Suva residents from Verata in the development of their area. The project has been able to draw on Suva dwellers' participation along the way. Most critically, however, the project has been able to work with local leaders who care deeply about the way resources are managed and have learned new skills in the process.

The relationship between Verata and USP is woven from many threads. One strand goes back to the early 1970s to the relationship between USP Professor of Natural Products Chemistry William (Bill) Aalbersberg and his teacher of Fijian during Bill's stint as Peace Corps Volunteer. Another strand was added in 1993-1995 with the Community-Based Biodiversity Conservation surveys carried out by USP Professor of Pacific Islands Biogeography Randy Thaman.

One of Professor Thaman's mature students was the son of the paramount chief of Verata. He had expressed concerns about diminishing natural resources in Verata. As part of a project funded by the McArthur Foundation, two villages in Verata developed biodiversity lists of useful organisms using Professor Thaman's rapid rural assessment method. In this method, different groups generate lists of a certain number of various types of organisms (e.g., grasses, medicinal plants, animals, shellfish) and their cultural significance. These lists were collated and discussed with the communities. The follow-up development of plans to conserve this biodiversity was taken on in association with the BCN project.

Table 1 presents some information about the land and population of Verata. [Final version should include a map as well.] A new census in 1997 and socioeconomic monitoring planned for February 1998 will give us more precise information about the community.

TABLE 1: VERATA DEMOGRAPHICS AND ECOSYSTEMS

Population (1995 census): 1571 residents in 319 households. In addition, there are 643 urban residents with rights in Verata
 Number of villages: 8
 Number of *mataqali*: 49 live in Verata directly controlling a total of 503 ha of land
 Total area of Verata: 95 km² (marine) + 140 km² (terrestrial) is total area of Verata *tikina* and *qoligoli* (traditional marine management area)
 Main revenue generating activities: Selling *yaqona* (kava) and crops such as *dalo* (taro), harvesting sea creatures such as beche de mer, mud lobster, sea cockle, fishing, land leases
 Key habitats: coral reefs, mangroves, riverbanks, shoreline, garden areas, grasslands and secondary forest
 Sustainability indicators being monitored: population of *mana* (mud lobster) and *kaikoso* (clam) (*Anadara antiquata*)

As the idea of a bioprospecting project was conceived within USP, partnership with Verata seemed a natural choice. The project team, which by then included SPACHEE, contacted traditional and government authorities to vet the idea of a bioprospecting project that would use their resources. The team then met with the community to discuss the concept and the nature of participation.

Lively discussion ensued. People were interested in having their medicinal plants evaluated and receiving financial benefits, but linking these activities with conservation raised questions. For example, if certain marine areas were declared *tabu* for gathering, would bioprospecting proceeds adequately compensate for the loss of commercial or subsistence returns from the non-use of *tabu* sites? What timeframe would be adequate to regenerate the key species in the *tabu* areas? These are complex questions that biological and socioeconomic monitoring are helping to answer.

Full community support is critical because the central objective of the project is to link the process and benefits of bioprospecting to conservation. These communities were accustomed to people coming and taking plants with minimal, if any, benefits so the idea of communities receiving substantial benefits was warmly received. They were also concerned about environmental issues such as overfishing, mining and coral harvesting. The project provided an example of how benefits could be obtained through conservation rather than extraction.

Project Activities in the Community

Direct community participation during the initial phases of the project conveys the message that community voices will be heard throughout all project activities. What becomes clear to local participants from this message is that their knowledge and input from the outset will become the foundation upon which all project activities are structured. While this may seem at first to be a “common sense” approach, the history of integrated conservation and development projects (ICDPs) shows that, according to a recent review, “ICDPs often do not spend enough time identifying community institutions and their relationships...[they] should devote more time and financial resources to working with community institutions” (WWF ICDP internal review, 1997:30). Moreover, where projects succeed in facilitating local input from the start, some fail to revisit this message later during more technical phases of the project (e.g., monitoring and evaluation, empirical data analysis). Project managers assume that these project activities are not appropriate within a rural community context or of any procedural value to local decision-makers.

The WWF ICDP review goes on to say that “[I]ntegration of local knowledge is difficult because ICDP planners and implementers frequently do not share the same values or world views regarding people and nature as local peoples. Traditional conservation approaches separate people and nature...Planners need to understand and use local names,

land-use classifications and terminology to facilitate discussions with the community regarding management of resources. ICDPs must work to make the dialogue between ‘projects’ and communities more of an equal, two-way process” (*Ibid*, p. 31). As we see below, the project activities in Verata are fully in line with these recommendations. Local ownership of the project process is a direct consequence of the commitment to community participation from the project outset. An appreciation of the value of local concepts within the most technical aspects of the project (monitoring, sample collection) strengthens this sense of project ownership even more. In some cases, participation in resource management workshops and monitoring rekindles pride in traditional practices as participants see how their concepts compliment applied scientific principles during fieldwork to provide a fuller, more comprehensive perspective towards resource management issues.

During the planning phase of the project, SPACHEE organized three participatory workshops in Verata that focused on natural resource management. These workshops included a one-day environmental awareness workshop in all the seven villages, a participatory rural appraisal workshop in Ucunivanua (the Chiefly village in Verata), and a community integrated resource management workshop held in Kumi and Ucunivanua.⁵ At present these activities are funded under the BCN project but, lacking such external funds, sample fees could be used for these important purposes.

The series of one-day workshops were held in February 1996, organized and conducted by SPACHEE together with the Fiji Department of Environment. The two main objectives of the workshops were to identify the ten most important problems in the village and opportunities/solutions to these problems. One of the significant results of these workshops was the willingness of the villagers to be open in discussing a broad range of environmental issues.

The major environmental issues raised by most the villages were:

- Inadequate water system (pipe, tanks etc)
- Coastal erosion
- The use of *duva* (derris root) as fish poison, which is an unsustainable fishing practice
- Soil erosion and siltation due to road construction close to the villages
- Indiscriminate burning practices

The workshops screened environmental videos as well as videos of the village environmental issues. These videos sparked intense discussion about problems and solutions. The participants sketched their own village and area maps to show where resources, activities, problems and opportunities are located, to see the dimension and scope of issues to be investigated, and to know the boundaries of resources. The maps included information such as:

- Topographical data (elevation, slope, drainage, etc)
- Information on soils, vegetation, agro-ecological zones
- Infrastructure
- Water availability

⁵ Since the workshops, another village has been added to Verata *tikina* to make a total of 8 villages.

- Areas with specific problems or potential for improved production.

A participatory rural appraisal (PRA) workshop was then held for a week in June 1996. Representatives from six of the seven villages in Verata came to the workshop. The main focus of the workshop was biodiversity conservation. Participants looked at the ecosystem role of habitats such as mangrove and coral reefs in their areas, after which they ranked community problems. They prepared a **community action plan** for their own villages at end of the workshop. Resource people from some government agencies, NGOs and USP came to assist in the PRA workshop.

The organizers felt that, on the whole, the series of one-day workshops and the PRA exercises were an effective way of raising environmental awareness because community members actively participated in the discussion as well as coming up with resolutions. It was not a one-way communication. Table 2 presents the community action plan of Ucunivanua village.

TABLE 2: UCUNIVANUA VILLAGE COMMUNITY ACTION PLAN

Problems	Causes	What has been done	What could be done	Opportunities	Who should do it	When
1. Consumption of Yaqona (Kava)	Excessive consumption of yaqona. It has not been adequately addressed during village meetings etc. Poor time management has resulted to the abuse of yaqona consumption .	This issue has been addressed in church as well as village meetings. There has been a village rule imposed not to have yaqona sessions on Sundays but this has not been successful.	To strengthen the enforcement of the rule that has been placed before regrading no yaqona drinking on Sundays. Seek advice from the department of Health on the effect of the excessive yaqona drinking. Thus, the community can be educated why they must not drink yaqona excessively. To have a specific village law that prohibits people from abusing the consumption of yaqona. To find another commercial crop to replace yaqona.	To have a special village meeting to just to discuss this issue.	The headman of the village should organise and facilitate this meeting.	Next village meeting.
2. Disobedience	Some people are reluctant to listen and change their behaviour. The reason is because they do not fully understand the consequences of their	It has been addressed in church and village meetings.	To have community education which specifically deal with these issues. To re-introduce some of the Fijian village laws that existed during the colonial period.	To inform the Provincial Office and the Fijian Affairs Board.	The village Headman	May.

	actions.					
3. Inadequate Toilet & Kitchen	There has been poor commitment shown by some in the community to build proper toilets and kitchens for their own families.	This has been discussed during village meetings. The Health Department has been approached if they could provide some assistance. There has been a request put forward to the District Officer if he could be provide chainsaws in order to cut some of their trees to be used as timber for their kitchens and toilets.	To seek assistance and advice from relevant government departments as well as other agencies.	To approach the Health Department.	Village Committee.	April.
4. No replanting	Disobedience and poor time-management.	This issue has been discussed during village and district meetings. There has been some replanting done during communal village activities such as “solesolevaki”.	Seek assistance from relevant government department such as the Land use Department.	To count the number of gardens.	Head of each clan and the village Headman.	May.
5. Improper rubbish disposal.	There are no proper dump site.	This has been addressed during village meetings and they have actually dug some other holes to be used as dump sites.	A need for more Community Education / Awareness workshop on health & environmental issues.	To dig more dump site.	The village Headman.	May.
6. Water Tank	Inadequate water supply	Nothing has been done to find a solution to this problem.	To seek government assistance in the construction of a larger water tank. To seek government assistance in purifying their water in the current water tank.	To contact the Water Supply unit, Public Works Department (PWD).	Village Committee to discuss this issue in their next meeting.	October.
7. Poor drainage system	People dumping their rubbish in the drains. Livestock which are not properly fenced such as pigs and cattle have damaged the drains.	It has been discussed during the district as well as village meetings Livestock to be properly fenced so that they do not roam into the village.	To be part of the village development plan	To seek assistance from the Health Department.	Village committee.	May.
8. There is no village carrier (truck)	There has been no funds set a side to purchase a village carrier	It has been brought up and discussed during the village meetings.	It has been one of things included as part of their development	To be discussed at the village meeting.	The village community.	May.
9. The village do not have a sea wall which has resulted to coastal erosion	The cutting down of mangrove.	It has been discussed at the village meeting. The villagers have piled rocks along the shoreline to act as sea walls.	Seek assistance from government.	To continue with the work that they are currently doing and that is piling rocks along the shoreline as a temporary sea wall.	The village community.	Communa l village working day.
10. Indiscriminate	Soil erosion.	Some trees have been planted.	Seek assistance from the Forestry Department.	To replant trees particularly	The village community.	May.

logging		Previous Environmental Awareness workshops have helped the community to understand the various values of their trees.		those which are becoming scarce.		
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Integrated Resource Management Workshop for Verata Tikina

SPACHEE came again to Verata in July 1996 to help the community design a resource management plan. The overall objective of this workshop was to assist villagers to develop the skills needed to plan the sustainable commercial and subsistence use of their natural resources, including the protection and rehabilitation of those resources—in particular plants and animals that are rare, endangered or of particular cultural, economic or ecological importance.

The initial pilot villages were Ucunivanua and Kumi Villages, with the remaining five villages in Verata to be covered after the first two workshops had been evaluated. The workshop was held overnight in each village to take advantage of informal discussions at night and to avoid hurrying to return to Suva. The aim was to develop a model that can be adapted for rapid application to many villages.

The participants included a wide range of men and women, older and younger people who could play a central role in the promotion of the protection and sustainable use of resources and biodiversity. Representatives from other villages in Verata were also invited. This workshop was supposed to train them to be facilitators in their villages.

The main issues discussed were: the concepts of sustainable development; the importance of the protection and sustainable use of biodiversity and ethnobiology as natural and cultural capital (the bank account) needed for the development and maintenance of this generation and of future generations; and the need for community-level management and planning of the use of natural resources.

First, there was a brief discussion of the nature and importance of biodiversity and ethnobiology and its management as a basis for sustainable village development, and the distribution of lists of plants and animals and uses generated during the 1993-1995 Community-Based Biodiversity Conservation surveys. There was also some discussion on the types of development that seem to be unsustainable and destroying the biodiversity of the area.

Then the workshop broke up into smaller groups to identify and discuss:

- The various types of plants and animals (both marine and terrestrial species) becoming scarce or extinct;
- The types of ethnobiological knowledge that should be preserved and protected;
- Actions that can be taken/strategies (both traditional and modern) that can be used to protect or sustainably use biodiversity for both commercial and subsistence purposes.

One of the most important outcomes of this particular workshop was the development of an integrated resource management plan. On the last day of the workshop the villagers compiled

their own resource management plan. This integrated resource management plan covered both terrestrial and marine resources. Tables 3a (terrestrial) and 3b (marine) comprise the resource management plan for Ucunivanua village.

TABLE 3: UCUNIVANUA VILLAGE RESOURCE MANAGEMENT PLAN

3a. Main Causes of the Destruction of Terrestrial Resources	Solutions
• Excessive burning	• Immediate stop to burning.
• Indiscriminate logging practices	• Stop unsustainable logging practices
• Tropical Cyclone (natural disasters)	
• Flooding	
• Soil erosion	• To have proper sustainable agricultural management methods when cultivating on steep slopes • To plant small trees and grasses on bare lands
• Animal destruction	• To properly fence all livestock.
• No replanting and indiscriminate land clearing activities	• Protect plants which have important cultural, economic and ecological uses.
• Increase in commercial agricultural activities thus oversupply of crops in the market.	• Do not over cultivate land used for agricultural purposes- have sufficient fallow periods. • To provide just adequate supply of agricultural produce for the market.
• Drought	
• Prolonged wet season	
• Advice from the Department of Agriculture are not followed	• To take heed of the advice given agriculture extension officers
• Abuse of the resources	• Plant and replant all the various important plants such as fruit trees, medicinal/herbal plants etc.

3b: Main Causes of the Destruction of Marine Resources	Solutions
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• The use of duva which indiscriminately kills every living organism in the sea.	• Ban the use of duva.
• The use of dynamite.	• Ban the use of dynamite.
• The use of small fishing nets.	• Ban the use of small mesh size fishing nets.
• Tropical cyclone and tidal waves.	
• The abusive use of marine resources (overfishing).	• To have marine reserves particularly areas which have been found to be breeding grounds for fish as well as other marine species. • Protect and police the fishing grounds.
• Flooding.	
• Destruction of mangrove areas.	• Reduce the amount of fuelwood being cut from mangroves.
• Extraction of corals for commercial purposes.	• Stop any form of coral extraction.
• Disposing household waste on the sea shore as well as in the sea.	• Not to dump rubbish in the sea or along the sea-shore.
• Destroys the habitats of some marine microorganisms and other species.	
• Over harvest for commercial purposes.	• Protect the various marine organism habitat.
• Increase in the numbers of people fishing at night.	• To police and prohibit people from fishing at night.
• Too many people been given fishing licence.	• To stop giving fishing licence.
• Advice given by the fisheries department not followed.	• To follow the advice given by the Fisheries department.

Project Relations with Suva Based Committee

The community of Verata is not only a locale but also a network of kin and neighbors that stretches from the ancestral homelands to the cities of Fiji and on to the rest of the world. These Verata people remain by and large concerned about and involved in the development of

their lands, and their heritage. Thus the Suva-based Verata Development Committee got involved at an early stage of the project to advise project planners.

The group met regularly on an *ad-hoc* basis. Professor Aalbersberg or a SPACHEE representative often attended these informal meetings, at first to explain the idea of the project. Later, once the group had agreed to the project and assisted in getting approval for it from the paramount chief, advice was sought on the conduct of the project. The role of this group highlights a key factor often missed in community resource management: that the community is not just the people living in a given area, but those who may have migrated, temporarily or semi-permanently, from the area. These people are often the main source of investment capital and ideas for community ventures.

Biological Monitoring

During the first year of project implementation (1997), BCN consultant John Parks of Ecotrack Consulting, together with SPACHEE and WWF/South Pacific, held a workshop to train community members in biological monitoring. This workshop employed local concepts of resource use, ecological principles, and scientific sampling and analysis to develop a monitoring program that would be totally implemented by the community teams.

Because a semi-structured, highly participatory methodology was used to develop the Community Action and Village Resource Management Plans during the initial phases of the project, the community was prepared for the more technical phases of the project, such as project monitoring and evaluation (M&E) and sample collection training. The structure of the biological monitoring workshop completed during 1997 was intentionally built on of the earlier PRA workshops. Previous outputs such as the Community Action and Village Resource Management Plans were revisited in order to provide a community-developed framework from which to discuss M&E and bring about a seamless integration among community exercises.

Participatory M&E is designed so that as community members collect relevant information on their natural surroundings, such information can be used to enhance decision making, and capacity to address threats to biological resources. Thus, the process of participatory M&E is inherently tied into such issues as empowerment, self-sufficiency, and sustainable use. This process of using information systematically to address challenges to resource management is known as "adaptive management." In the case of Verata, the communities have chosen where project monitoring efforts are to be focused. They chose which species to monitor and where to lay transects. Due to the local ownership of the adaptive management process, there is greater likelihood that monitoring activities will be sustained. Evidence of low monitoring costs with a corresponding increase in monitoring efficiency is found in the 1997 Biodiversity Conservation Network Annual Report, Chapter 4.

Quantitative rigor has an important role in project management. The collection and analysis of both ecological and socioeconomic data are essential to show if conservation is occurring, and if development objectives are being met. Participatory M&E has served as

an effective tool for Verata residents in acquainting themselves with their role in such technical aspects of project management. Direct observation and simple quantitative techniques of resource monitoring are neither beyond the scope of local stakeholders nor incompatible with local notions of natural resource ecology. In fact, the Verata example has become a model for how to fuse scientific principles with local customs and practices. This monitoring protocol can be used for periodic evaluation of whether or not the bioprospecting project's conservation objectives are being achieved.

The monitoring program attracted the interest of NGOs and government officials who were unaware that community members could learn and practice skills involving scientific measurement and data analysis. Consequently, a second workshop was organized for government, NGOs and other individuals interested in the methodology. Held in Suva with a one-day field trip to Verata, and facilitated by the community monitoring team with the help of Parks and SPACHEE, the workshop was a great success. One government official remarked that "In sixteen years of government service, I have never attended a workshop in which I worked like this with members of NGOs. I had previously viewed their intentions with suspicion but now realize that they can be valuable partners in our conservation work."

Training for Community Sample Collectors and Collection Activities

Each village was invited to appoint two members interested in and knowledgeable about local plants to become sample collectors. About ten people, several of whom had been part of the biological monitoring training, assembled at the training site. Mr. Marika Tuiwawa, a botanist in the Biology Department at USP, had worked with Professor Aalbersberg to develop a list of plants to be collected based on those desired by SIDR and those identified in Verata by Professor Thaman's rapid rural assessments.

A half-day was spent in discussing the purpose of the collections, how plants would be collected, and voucher specimens prepared. The collection required about one kilogram of plant material to be placed in labeled bags together with a name card, location, and the name of the collector. The list of desired plants was distributed and collections made using local knowledge about where the plants could be found. Sixty-five plants were collected in one day and a half days of the first meeting, and another forty on a collection day a few months later. Verata has a much richer marine than terrestrial biodiversity, as much of the land consists of grasslands and secondary forests.

In November 1997, two of the members of the collection team were asked to participate in a People and Plants Workshop organized by the WWF-SP and conducted by ethnobotanist Dr. Gary Martin. Participants learned how to prepare voucher specimens and use them to develop a community register of their important plants. It is anticipated that in 1998 two villages in Verata will prepare a register of fifty key plants.

Pohnpei Presentation

At the biological monitoring workshop, two key community leaders—Ratu Pio Radikedike⁶ of Ucuivanua, and Tomitiani Boginivalu of Navunimono—became team leaders for monitoring. These leaders have proven to be a source of inspiration not only within their own locales, but more widely in the Pacific conservation community, as a result of their presentation on community biological monitoring at South Pacific Regional Environmental Programme's (SPREP) 6th Conference on Nature Conservation in the Pacific, September 1997 in Pohnpei, Federated States of Micronesia (FSM).

Ratu Pio and Tomu were the only community members from outside the FSM who made a presentation at the conference, which had as a theme community-based conservation. Their presentation received a great deal of attention and praise from different participants. They were able to discuss their work and the situation in their community with the paramount chief of Pohnpei, and the World Bank representative at the conference cited their presentation as exceptional. A tape was made of the presentation and returned to the villages so that others could see it. Verata was on the map as a pioneer area for community resource management.

This recognition of the role of both science and tradition in participatory project management was the fundamental premise behind the Pohnpei presentation. This concept was warmly received by other Pacific Island managers and policy makers who share the same pride for their traditional heritage as do the Verata residents.

The Next Phase

The BCN program is slated to end in March 1999, but the partnerships will remain, and in all likelihood, expand. Important activities for the next phase will include:

- Ongoing sample collection in Verata, perhaps developing links with other communities at other sites.
- Community leaders from Verata will work with other communities in Fiji and perhaps elsewhere on community conservation activities and biological monitoring.
- Benefit Distribution. How will the sample fees be distributed in the community? This distribution has been left up to the community, but the project team may advise, perhaps looking at strategies for investing the money in other enterprise.
- Investment Strategies. One enterprise of interest to the community is the processing of kava (*Piper methysticum*) residue. Kava is a popular drink in the Pacific that is receiving wide renown in the world for its medicinal properties. The residue of the drink can be used as well for certain products.
- Stewardship and Socioeconomic Monitoring. A series of workshops will focus on helping the community to monitor socioeconomic impacts of the project—not only the benefits but the impact of monitoring and workshops. How can stewardship be defined and enhanced by the community?

Conclusion

⁶ “Ratu” is an honorific that signals a person of chiefly rank. Ratu Pio is the administrative head of a village as is Tomitiani.

This case has shown how a community can play an active role in a bioprospecting project, and how bioprospecting can be linked to wider conservation objectives. We have seen how the project was conceived, how the community involvement was structured, and how knowledge of the concepts and issues in conservation has accrued over the life of the project.

The Verata residents and wider community have continually and collectively decided upon the path the project has taken, and their decision-making processes have had a direct correlation with the evolution of the project into what it embodies at present. The fact that there has been a high degree of “hand-shaking” between the project partners vision and the communities’ vision of where the project should go is partially reflective of the project partners’ ability to: a) clearly hear and internalize local residents’ expectations of what decisions need to be made for which resources; b) effectively act as facilitators, rather than manipulators, towards the communities’ perceived end result of the project; and c) ensure that consensus is built between communities and participants involved.

A project is not a community. Life goes on in Verata: people have to make a living, get food, send their children to school and contribute to their church. A project can only do so much in a short time span. The relationships are strong, however, and the commitment to conservation has come from the beginning from community leadership. In a few years we will see the fuller impact of these activities as people continue to take steps to conserve their biological resources. The Fiji government is increasingly active in this arena and interested in Verata as a model. So too are other communities in the Pacific and the world that are grappling with rapid deterioration of their resource base. Innovative ways to obtain the financial, social and intellectual capital for development that can conserve resources are sorely needed. If bioprospecting is carried out respectfully and judiciously, the benefits can be solid, and the risks minimal. Linked to community resource management and tied into other enterprise options, community bioprospecting can provide an important catalyst for sustainable rural development.

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