Building Bridges: the contribution of traditional knowledge to ecosystem management and practices in Fiji

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Abstract

Developing nations such as Fiji are grappling with how they can utilise their environmental resources to improve local living conditions while protecting the integrity of ecological systems. Different development approaches are adopted but in these areas, the environment is altered and polluted as a result of sustained human activities. The situation is challenging, as environmental resources have to be maintained to provide the services that are critical for sustainable development.

In recent years the value and relevance of traditional knowledge has been acknowledged as people realised that such knowledge and wisdom have allowed people to live in their specific surroundings throughout history. This realisation has made people appreciate and acknowledge the value of traditional knowledge to ecosystem management. In this paper, the focus is to highlight some of the instances where people today can take advantage of traditional knowledge and incorporate it into science-based contemporary resource use strategies and methods. In this manner, bridges built to link traditional knowledge and science can contribute substantially to the attainment of sustainable development in some of the most important habitats and ecosystems occupied by traditional communities throughout the world.

The Millenium Ecosystem Assessment (MA) currently undertaken in different parts of the world is a valuable opportunity to document the influence of humans on the ecological systems and vice versa. The MA will provide useful new and specific examples from throughout the world to demonstrate the close relations between traditional societies and their environmental resources and the lessons that can be learnt from their experiences.

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Background

At the dawn of the new millenium, people in developing countries are still grappling with issues such as sustainable development, poverty alleviation, high population and rapidly depleting renewable environmental resources. These issues have become prominent despite the various approaches and strategies that have been adopted in developing countries throughout the world to attain sustainable development; development that is economically, environmentally and culturally fulfilling and meaningful. Instead of attaining better living conditions, most developing countries are struggling with stagnant economies, unequal development, increasing unemployment and rapidly worsening environmental conditions. One thing that is certain is that the natural environment cannot sustain the industrialized and monetized economy that contemporary nations and communities aspire for.

In recent years the value and relevance of traditional knowledge has been acknowledged as people realised that such knowledge and wisdom have allowed people to live in their natural surroundings throughout history. Some of these natural surroundings were very harsh and demanding and required intimate knowledge and adaptation. This realisation has made people appreciate the value of traditional knowledge to ecosystem management. Unfortunately, people in traditional communities are rapidly losing this knowledge as they become more involved in contemporary resource use activities that treat traditional knowledge with skepticism.

In this paper, the focus is to present some of the traditional knowledge and experience from indigenous Fijian communities that provide people today with useful lessons on sustainable resource use and survival. The paper has three sections. The first part

summarises some of the traditional Fijian knowledge on food sources, agricultural systems, medicine, social relations and resource management that are known and used in Fijian communities and can be the basis of approaches that incorporates science to further their effectiveness and relevance. The second part demonstrates how traditional resource use practices have been made the basis of contemporary science-based marine resource management. The third and final section brings together the reasons why traditional knowledge can be made the basis of contemporary resource management and the important contribution that the Millenium Ecosystem Assessment can provide towards the attainment of this noble goal.

Traditional Knowledge

Although classified as non-scientific, traditional knowledge have been accumulated after centuries of extensive trial and error experiences from which people have learned. In the sub tropical conditions in the Pacific Islands, people have used traditional knowledge to live off the environment on which they depend for food, supplies, medicine and culture. An appreciation of some of the traditional knowledge will provide an insight into how the people use and depend on their environment and its resources. Traditional knowledge can be the basis on which scientific research is utilised to explain the details that up to now may be unknown or unexplained.

Food Sources

Traditional food sources in Fiji are mostly found within the surrounding environment. This makes it imperative that the environmental conditions are not altered drastically. There is little external food source except the delicacies that are exchanged or bartered in the customary manner. On such occasions, people exchange what they have with goods that they need. Coastal dwellers thus would exchange salt, dried fish and other marine and coastal products with gifts of root crops and artifacts from their relations. People from relatively resource poor islanders are known to trade canoes and their other carvings for pottery and food.

Food sources in rural communities included those that are meticulously cultured and those extracted from the wild. These two sources of food complement each other and provided continued food supply even during drought and famine, and prevent starvation. People periodically harvest wild food sources such as yams, giant taro and fish to spare the crops from their small gardens. In addition, there are tree crops like coconuts, breadfruits, plantain and bananas and other fruits such as pawpaw, mangoes and oranges, which periodically become the staple diet when they are in season.

In addition, wild food sources are dependable sources of food that provide welcome relief in difficult times. Wild yams, giant taro, vegetables such as fern (*ota*) and *duruka* are consumed whenever available as sources of starch and protein. Coconuts and vines are alternative water sources. In the sea, the wide range of food available assures people of a healthy existence. Indeed, the indigenous fishing techniques throughout Fiji illustrate the people's intimate understanding of their food sources (Veitayaki 1995).

Empirical knowledge of the environment and its dynamic nature is exemplified by the traditional calendar, which is based on the main farming activities and what sources of food are available at different times of the year. This calendar is still widely used by all Fijians as the basis of people's resource use activities. This traditional schedule is not publisised by is known to all Fijians in rural communities. January is associated with the abundance of spinefoot and rabbit fish (*nuqa*), shellfish and bivalves (*kaikoso*) and trochus (*vivili*). This month is also when land crabs (*lairo*) spawn in the sea and breadfruit trees bear fruit. February is when the yam gardens mature and the offering of the first produce *(sevu)* are made to the chiefs, landowners and the church to give thanks for the crop. In March, crabs (*qari*) mature and bear eggs. In the gardens, the harvesting of yam continues. April is when reeds (*gasau*) blossom and flower. This is when breadfruits ripen. In the sea, the bigeye scad (*tugadra*) is plentiful. In May, yam harvesting is continued and storage houses (lololo) are packed while at sea, there is a lot of chub mackerel (*salala*). June is when the clearing of the new yam gardens begin. In the sea, silver biddy (*matu*) and goldspot herring (*daniva*) are plentiful. July is remembered for the abundance of octopus (*kuita*) and rock cod (*kerakera*) and the

completion of work on the yam garden. August is known for the abundance of octopus and the fishing of little priest (*vaya*). In September, yams begin to sprout and supporting sticks are put in place to support the young plant. Rock cod (*kawakawa*) spawns during this time while mango trees flower. In October, breadfruit matures and sea-worm (*Eunice viridis*, *balolo*) is collected. November is marked by the continued collection of *balolo*, the maturing of crabs and the abundance of spanish mackerel (*walu*). On land, a lot of local fruits mature. In December the cycle rounds off, with the spinefoot, rabbit fish (*nuqa*) and trevally (*saqa*) spawning. This calendar provides a guide to what people do based on the knowledge of environmental conditions that has been passed from their ancestors and has meant a continued supply of food for the people.

The wild food sources provide a bulwark against starvation during disaster, drought and famine. The utilization of these wild resources requires skills and knowledge. People know how to prepare and consume normally poisonous giant taro species and when and how to look for wild yams (Thaman and Clarke 1987). In some cases, areas of secondary growth are burnt to facilitate the location of wild yams, which can easily be isolated in a newly burned area. During drought people drink juices of vines (*Eutada phaseoloides*, *walai*), sugar cane and coconut. Fruits such as mangoes, kavika, oranges and molikana all can take away hunger.

People in subsistence societies are wary of the periods of shortages and practised different ways of conserving food. Surplus breadfruit and cassava are preserved in specially prepared pits where they are buried to ensure that some of the surplus is saved for the off-season when it may be handy (Aalbersberg 1988). Similarly, mature cassava that can be rescued from damages by hurricanes and floods are preserved for the difficult times months later when local supplies run low. The yams can store for long and are harvested and stored in specially built houses. People also planted different species of yams, taro, and cassava, which mature at different times and are suited to different environmental conditions. Fish and other protein were smoked to allow longer storage and preservation. Some fish and turtles can be raised in captivity to ensure future supply.

Farming System

Traditional agricultural systems of slash and burn, shifting cultivation and multi-cropping are well developed in rural Fiji and are arguably the most suitable system of farming in these subtropical conditions. With the crude tools that people use, the clearings are restricted allowing for small gardens. The undergrowth is slashed and allowed to dry in the sun before it is torched. The burning keeps the pests and weed away as well enhance the return of burned nutrients to the soil. After some two to three crops, a plot is returned to fallow, which allows the land to revert to its natural state through succession. The cultivation of different crops provides a variety of supplies that mature at different times and thrive under different conditions providing continued food supply.

Shifting cultivation and 'slash and burn' system of agriculture practiced in Fiji is suited to the type of farming implements people have. The size of the gardens and the use of digging stick minimize the alteration of the environment. Furthermore, cultivation on a piece of bush land is for about three years before a new garden is cleared. People shift to new garden sites when productivity from their current land decreases, while weeds and pests thrive. Shifting cultivation therefore allows the land to replenish, a practice that rendered unnecessary the use of fertilizers, pesticides and weedicides which are an integral part of contemporary farming.

Multi-cropping ensures that a variety of crops is simultaneously grown at any one time to allow continuos food availability. Multi-cropping is an adaptive farming measure to allow people to have a variety of sources of food available from the same garden area at all times. Even after a farmer has moved to a new site, coconuts, plantain, bananas, breadfruit and mango trees in the abandoned garden site can be part of the fallow and the regeneration. The farmer and his family can still harvest these crops. Furthermore, fire, hurricane, flooding and drought will not affect crops like yams and sweet potatoes (*kumala*) in the manner that they will affect taro, banana and vegetables.

The people have some intensive and semi permanent systems of farming, which provide crops that take different times to mature. In parts of Fiji, irrigation, terraces and swamp draining systems are still used today. These types of crops are less affected by climatic variations and can be kept for long, which make the farming system an attractive alternative to people. People plant taro in the swamp for long term crops compared to dry land taro gardens. Quick maturing crops such as sweet potatoes and some varieties of cassava are ofetn grown after hurricanes as people try and secure food three to six months into the future. This is the reason why Fijian farmers have a number of little gardens in different areas. Fijian farmers are well aware of the dangers of having all of their future placed in a single crop or garden. Indeed, the Fijian farming system has evolved over time in response to specific cultural and environmental conditions.

Medicine

Medicinal plants in traditional communities in Fiji are freely available in the surrounding areas. The roots, barks, leaves and shoots of certain plants are used to cure all types of ailments. Knowledge of some of the medicinal plants is passed down family lines and is not publicly known while others are more commonly used. Examples of some of the well known medicinal plants used for common cold include *Terminalia catappa (tavola), Rhizophora* sp. *(titi), Physalia angulata (cevucevu), Bidens pilosa (batimadramadra),* and *Zingiber zerumbet (cago)* (Parham 1972). Cuts and sores are treated with *mikania micrantha (wa bosucu), cantella asiatica* (*totodro),* and coconut (*Cocos nucifera*). (Wainimate 1997; Weiner undated). Specially blessed individuals whose gifts are associated with magical powers related to the gods and ancestral spirits possess healing power. The medicine men and women are revered within their communities and are widely known. People therefore know who is to be approached for different medical attention.

The preparation of medicines is varied but is considered a special gift amongst Fijians. Some of the medicines are a collection of plants while others are from a single source. Medicines are either consumed directly or are boiled in solutions, which are then

consumed. Other medicine may only be applied externally as portion to be used to massage or rub the body. Some of the medicines are offered with specific conditions such as abstention from certain food and activities. Indigenous healing and medicine are cheap, easily available and should be used by people until the sick can get to a medical center.

In some instances, indigenous healers have cured people who could not be treated in hospitals. Most of Fiji sport personnalities have sought treatment for broken bones from traditional massuers while some couples testify to the success of 'traditional bath', which make people bear children.

Traditional medicine provides valuable relief in rural areas in Fiji where medical centers often are far. The Fiji Ministry of Health is now working with the indigenous healers to provide affordable health for all the people of Fiji. Fiji is taking advantage of its indigenous medicine as an alternative medicine that is promoted in the attempt to curb the increasing cost of medical care.

Social Relations

Indigenous Fijians lived in villages in well-defined social units that are the basis of all social groupings and activities. The village is characterized by 'subsistence affluence' rather than the abject poverty that was prevalent in many other developing countries (Fisk 1970:1; Knapman 1987:1). People are self-sufficient and practice intricate exchange arrangements. People in urban centres, for instance, would periodically exchange money with their rural-based relations, who would offer artifacts such as mats. Sharing with relatives ensures that the resources are efficiently used and that people looked after each other in times of need. Hoarding is neither practical nor necessary because people's basic requirements are supplied through their kin-based networks (Narayan 1984:13).

Kerekere, 'a system of gaining things by begging for them from a member of one's own group' (Capell 1991:95), is widely practised and ensures that surpluses are shared,

thereby preventing the accumulation of wealth (Nayacakalou 1978:40). Although no money is used and communal ownership of property is observed, people used goods such as whales teeth (*tabua*), kava (*Piper methysticum, yaqona*); artifacts such as mats, pottery, and carvings; and food to obtain and return favours (Nayacakalou 1978:102). This social kinship system is the safety net that enabled people to meet their needs in their harsh and uncertain surroundings.

The *vanua*, consisting of the land and its people, is the largest grouping of 'kinsmen who are structured in a number of social units, the living or human manifestation of the physical environment which the members have since claimed to belong to and to which they also belong' (Ravuvu 1983). The *vanua* comprises *yavusa,* which is made up of people in the same village and consisted of a number of *mataqali* and *tokatoka*. The *mataqali* is a close social unit consisting of a number of *tokatoka*. The *mataqali* often is the landowning unit. The *tokatoka* is the primary social divisions that have sprung from the subdivision of naturally increasing families.

A fascinating feature of the Fijian social system is the fact that people are related to one another because of where they were from and not because of whom they know. Social relations of m*ataqali* (a respectful relation between people from the Kubuna Confederacy), and *tovata* (a respectful and cordial relation between people from the Tovata Confederacy), *tau* (cordial and joking but close relation between people who are closely related because of their traditional gods), *naita* (jovial and joking but close relation between people from two different areas), *takolavo* (relation between two districts within Viti Levu where the people have special ties) and *dreu* (jovial and joking but close relation between people from Tovata Confederacy and those from Nadroga in Viti Levu) are some examples of how widespread the social networks extended guaranteeing that Fijian people assist each other because they are related. Everyone from the same island or province refer to each other as *kai* (originating from the same place) and the concept is adopted at others levels including nationally amongst Fijians living outside the country.

The incentive to work in an indigenous Fijian community is different because the principle of reciprocity rather than the monetary reward is a strong determinant in whether one is involved in work or not. The financial rewards that may accrue become a secondary consideration in a system where one 'has obligations to one's own group; and one is involved in the obligations of one's group to other groups' (Nayacakalou 1978:119). In such situations, the compulsion to work is related to the knowledge that one day one would require the assistance of others. Public opinion is a powerful sanction for culturally acceptable practices. There is keen competition between groups that used the exchange system and reciprocity to show one's social standing. The system gives indigenous Fijian society its structural strength. People holding authority are respected and obeyed because they have greater knowledge and experience of the local context (Nayacakalou 1978:15). Thus, the use of factors of production in Fijian villages is fundamentally an act of social service, not an economic one in exchange for one's labour, land or equipment.

Resource Use Practices

The main resources use practice in Fiji is the ownership of the resources extending to the outer reef slope. Land and customary fishing areas are owned by different, but closely related, social groups (such as *yavusa* and *vanua*) that regulate the use of the resource. People use their own allocations, and those seeking to use grounds belonging to others are expected to get permission from the owners. Land and customary fishing grounds owners, from time to time, declare a portion of their fishing grounds out of bounds to preserve the resources for an intended purpose such as a wedding, birth, or death-related ceremony (Ravuvu 1983).

Traditional resource use practices are enforced through traditional authority, which means that there are protocols to be followed. The social structure and close-knit units in Fijian communities demand that people follow tradition and respect it. Decisions made by the group are conveyed through the social channels of communication, which ensure that all those involved are made aware of the group's decisions. The decisions are then

sealed with a social presentation of *tabua* or *yaqona*, with reference to retribution. This makes the traditional system of retribution an effective deterrent to others in the community (Siwatibau 1984). The whole community therefore is aware of the decision made and are expected to comply with them.

The concept of sacred ground is prominent in Fijian societies. Sacred fishing grounds are special areas where special rules are observed. At such sites, fishing is conducted only when permission is granted, or when the special conditions and requirements are met. In Qoma, the people going to Cakau Davui are expected to perform the rituals of a party arriving in a village or area and to fish according to the rules that are widely known in the village (Veitayaki 1990). In Kaba, the customary swimming spot for the paramount chief of Kubuna is fished only when the chief requests. Otherwise, a complete ban on all fishing is observed in the area, which provides sanctuaries for fisheries resources (Veitayaki *et al.* 1996).

The association with the supernatural ensures that the fishing grounds are respected and protected at all times — and not only when enforcement officers are around. In such cases, 'a close association was perceived between the living and the dead, whose spirits inhabited sacred areas, who showed offence when customary taboos and rituals were not adhered to' (Siwatibau 1984). The thought of retribution by the ever-vigilant gods is a continuous reminder to the people of the need to treat their resources properly. The land and its adjoining fishing grounds in Fiji are associated with the spirits that protect them. In such societies, the environment is not something separate, 'but an integral part of one's self, providing the physical manifestation of the vital link between the living and the dead' (Siwatibau (1984:366). Outsiders, therefore, must observe the code of conduct in any area where they are visiting. It is expected that visitors make offering *(sevusevu)* to publicize their arrival at a place. This practice ensures that the members of the community are aware of the presence of visitors among them, and protects the visitors from the wrath of the spirits who show offense when customary protocol is not followed (Siwatibau 1984). The arrangement also ensures that the customary owners of fishing

grounds are consulted every time outsiders want to fish in their area. This custom discourages poaching and the illegal use of resources.

Traditional knowledge is closely associated with families, which is the institution that generate, store, accumulate, modify and transmit this knowledge. The system of extended families provides a wider base for the successful accumulation and transmission that ensures better chance of survival. The respect of elders in these communities is associated with the knowledge that elders have lived in these environments and have useful lessons to share with their younger relations.

Taking Advantage of the Traditional Resource Use System

Over the last four years, there has been a concerted effort within the country to take advantage of the traditional knowledge such as what I have described here which has allowed their people to survive in their environments. People are led to recognise the value traditional food system and the benefits of traditional farming. Traditional medicine is now recognised by the government to hold the distinct advantage of reaching all of the people cheaply.

Arguably the greatest use of traditional knowledge has been in the use of traditional resource use system to involve the owners of customary fishing grounds to improve resource management wthin the inshore fishing areas. In this case, a group of non-government organisations in Fiji has used the traditional resource use practices to work with coastal communities to promote the sustainable utilisation and management of their customary fishing grounds. The initiative is the result of increasing concern regarding the deteriorating status of coastal fisheries and the threat this would mean on food security in the coastal communities. The focus on marine resources was to make a start in engaging these communities. The focus is now being broadened to include the adoption of the integrated management approach to coastal resources. Traditional knowledge is adopted because the people in the communities are aware of these resource use systems and their effectiveness and therefore will commit themselves to a resource management system

they are familiar with. In addition, there are institutional arrangements in place to support the resource management decision people have made.

The experiences of the Fiji Locally Managed Marine Area (FLMMA) network provide useful lessons in the incorporation of traditional resource management practices with scientific methods. The process demands patience and understanding because to involve people in community-based resources management requires consultative work, goodwill, trust and commitment. These characteristic features are important because the lack of national legislation or resource management guidelines make it critical that the people be thoroughly convinced of their outside partners' good intentions.

FLMMA uses Participatory Learning and Action (PLA) methods to involve local people to manage their resources. The method involves a number of phases and steps, which emphasise the involvement of the people to determine their resource management activities. Background research and coordination are critical to ensure that the preparations and proposed management activities are relevant and appropriate. This is the reason why FLMMA teams comprise people who can converse in the vernacular and communicate with the people they work with. The training of community partners is an essential part of the approach to promote the PLA method and ensure that the people are familiar with the reasons why management is critical. Fieldwork is emphasised because the resource management activities should be set in a context. This has been the reason why in many instances, resource management arrangements that are finalised externally and taken to the communities to be implemented and observed failed. As is the case with national laws, people in these situations, are not familiar and not committed to such action, making enforcement by the authorities necessary. The data gathered demonstrates the significance of the management decision taken by the people and the information and data gathered locally. Lastly, follow up is critical because the local community needs to be constantly reminded and convinced that the resource management method is responsive to their needs.

Local communities are asked to reflect on the main problems they face and to propose ways by which these may be addressed. This opportunity enables the people to reflect on their situation and list the activities they can undertake to solve their problems. The list of activities, which outlines the management actions that the people agreed to undertake, becomes a resource management plan formulated by the villagers. Table 1 provides an example from Verata in Tailevu.

Table 1: Critical resource issues and management actions taken by a community in Verata, Tailevu, Fiji.

Issues	Management actions to be considered
overharvesting and overfishing of resources	• stop the issue of commercial fishing licence and use of gillnets • promote alternative income through USP such as from bioprospecting enterprise to offset short-term losses in income from actions taken • delineate species-specific reserves via no take area or no take species
mangrove and coral extraction	• banned
Siltation of coastal areas	• mangrove replanting and rehabilitation
trash and human waste	• establish village health committee to periodically organize beach and water cleanups • ensure that each household has proper toilet and rubbish pit.
poisoning fish	• ban the use of *Derris* sp plant and other killing agents

The management activities that local communities propose include a declaration of fishing restrictions, declaration of no take areas, identification of action to address pollution issues and coastal erosion, education and awareness activities, and promotion of a community management framework. No take areas are to be established as replenishment zones and specifically to rehabilitate depleted important marine resources and degraded habitats. The assumption used is that when the resource populations in the no take area recover and increase, there will be a 'seeding effect' to adjoining harvesting areas provided there is enough brood stock.

The communities and their FLMMA partners are responsible for the achievement of their adopted management plans. Traditional institutions are used to enhance compliance of the resource management activities. Representations are made to all the related social groups to ensure that the people in the areas are familiar with the management initiatives now undertaken. Follow up meetings, activities and training workshops are continued to maintain interest in the community. Biological, social and economic surveys and monitoring training workshops and activities are organised in all sites to allow the local communities to know what the status of their resources are in and any change that result from their resource management activities. These follow up activities provide useful tools. Up until now, people's claims on the status of their fisheries and the impacts of the intervention have not been substantiated. This is now be done through ecological, social and economic surveys and monitoring which provide the evidence on the effect of community-based intervention.

Local communities are asked to determine their own indicator species and to conduct their own monitoring activities. In Ucunivanua village, the community's data indicate that both the number and sizes of clams significantly increased in both the no take area and the adjacent harvesting areas. At the start of the project, it was extremely rare to find a clam bigger than 5cm in diameter. Today, the community routinely finds clams in the no take area that are over 8cm. In fact, clams exceeding the largest adult size class (> than 9cm) are now being found by villagers for the first time in three generations. As an additional indicator of ecosystem health, the community is finding that other fauna are returning to the system. For example, it has become more hazardous to conduct the surveys in shallow water because of the large numbers of stingrays (a major predator of the clams) that are now found in the mudflats. More importantly, once the people of other villages in Verata learned of the effectiveness of the no take area in increasing clam stocks on the mudflats in Ucunivanua, they proceeded to set up their own protected areas within their villages.

The locally managed marine areas are not being set up only for conservation, but also to improve the yield of marine resources that people use for subsistence and cash income. The increased resource yields of clams, mud lobsters, sea cucumbers, crabs, and other fish species from harvesting areas adjacent to the no take area has led to a 35% increase in household income over three years and a tripling of the resource catch per unit effort. This project also had an enterprise component by which the people of Verata district have received to date US$30,000 in proceeds from licensing biodiversity samples for testing. This money has been put in a community biodiversity trust fund and the interest has been used to support the monitoring work and to meet other community needs such as the improvement of the village primary schools, which would otherwise have been funded from the parents' minimal cash resources. At the World Summit on Sustainable Development, FLMMA was declared one of the six winners of the Equator Initiative for the successful articulation of poverty alleviation and conservation.

Building Bridges

People’s traditional knowledge, skill and experience provide them with the flexibility of having alternatives, which those in developed and urbanized areas lacked. Possession of these knowledge and skills can give the people of these changing communities a better chance of survival in instances where lack of money and facilities may prevent them from having the type of lives they desire in their modern societies. Armed with their traditional knowledge, Fijians and other Pacific Islanders may be able to enjoy the best of their worlds provided there are linkages between the two. For example, Fijians and other Pacific Islanders can use the traditional knowledge available to them to counter the inadequacies and inefficiencies that are inherent in their contemporary systems. Both Samoa and Fiji are doing this in an attempt to have more efficient management of their customary fisheries resources.

Although the environmental ecological services are critical for all, the people in traditional societies are more respectful of their environment than their contemporary counterparts who rely on technology and equipment to dominate the elements of their

world. In traditional communities people plant varieties of crops and use different farming technique to ensure a wider and better supply of crops. There are fruit trees and wild food sources that are for the taking for people who know how to prepare them. In addition, there are preservation methods that people employ to ensure that portions of bumper crops are saved for periods of famine and drought.

However, the questions for current generations are whether they still remember enough of their indigenous knowledge, skill and experience to resume the closer relations their forefathers had with their surrounding. Unfortunately, these traditional knowledge and skills of the indigenous communities were discarded or abandoned during colonisation. The thought at the time was that western knowledge is the best and can provide all the solutions. This fallacy has been demonstrated in the past when the food production and distribution systems are interrupted or will happen in the future to the health care system if people in rural areas lose all the indigenous medicinal knowledge they have.

Modern living is a challenge because people are discarding the traditional system where the provision of food was fundamental and are adopting commercial practices where earning money is the ultimate goal. People sell their labour for money, which they then use to purchase their dietary requirements. This is a threat to food security in developing countries because it has removed people from a situation where they have direct access to food to a situation where that access is based on the availability of money. As events in the recent years demonstrate, the access to money cannot be gurranteed. Events in recent times demonstrate how vulnerable people are today because of how humankind has changed the way it relates to the environment. Instead of surviving and living with the environment as in indigenous communities, people today have tried to dominate the environment using scientific knowledge and technology. The famine and poverty in heavily populated and war ravaged countries, the outbreak of the mad cow disease, foot and mouth, the terrorist attacks in the United States and the aftermath, the outbreak of SARS have all shown how vulnerable contemporary Western systems are.

The Millenium Ecosystem Assessment (MA) currently undertaken in different parts of the world provides a useful step in the incorporation of traditional and scientific knowledge. The MA will allow the local traditional communities to share their wisdom and time-tested knowledge, which can then be promoted to enhance sustainable development. These knowledge can also then be used to base scientific research that are needed to explain these knowledge so that they can be promoted more widely in areas outside of where they are known and used. This opportunity will ensure that humanity does not lose the benefit of the knowledge that had been acquired by their people over generations. Furthermore, traditional knowledge and science can be incorporated to allow better understanding of how ecological systems operate. Science should be used to explain traditional knowledge and provide insights into how people relate to and are influenced by the environmental conditions in the area they live in.

Conclusion

Traditional knowledge, wisdom and experience are valuable, appropriate and still relevant for people in developing countries like Fiji. It must be incorporated into sustainable development planning, contemporary development strategies and resource management arrangements. Effort must be made to ensure that the owners of the knowledge shared them accurately with contemporary users who must ensure that the owners' interests are recognised, upheld and protected. In New Zealand, the Maori's are undertaking an interesting initiative where their traditional healers are now working with their western scientists to document and study the intricacies of traditional medicine to better understand it. This type of initiative should be duplicated throughout the developing countries because the knowledge should be recorded and studied accurately if it is to be promoted widely. Such recognition of traditional knowledge would boost people's self esteem and pride and assure them of the many things they could do on their own to assist in their development. Contemporary communities have no choices but to take advantage of the lessons from traditional communities.

Resources management initiatives will only be successful if the approaches are holistic and are part of a broader resource management plan, which must make sense to all the people. This is where traditional knowledge and science have important roles to play in mobilising action to articulate sustainable living at the community level. The resource management activities must include monitoring and evaluation. People in the community need to understand how they benefit from the conservation initiatives. In this era where resources are getting scarce and cash needs are increasing, only the activities that are well presented and convincing will be observed. This is why a combination of tradition and science is required to convince people that the interventions are undertaken for their benefit and that people need to be committed to them even during their times of need.

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