NATIONAL ENVIRONMENT SERVICE
TU'ANGA TAPOROPORO
COOK ISLANDS

A REPORT ON THE IMPLEMENTATION AND ANALYSIS OF THE STATE OF CAPACITY AND FUTURE NEEDS TO SURVEY AND CONSERVE RARE VAIRAKAU PLANTS.

JULY 2004

Te Ao Ora Natura o te Kuki Airani
Cook Islands Biodiversity

Global Environment Facility

UNDP

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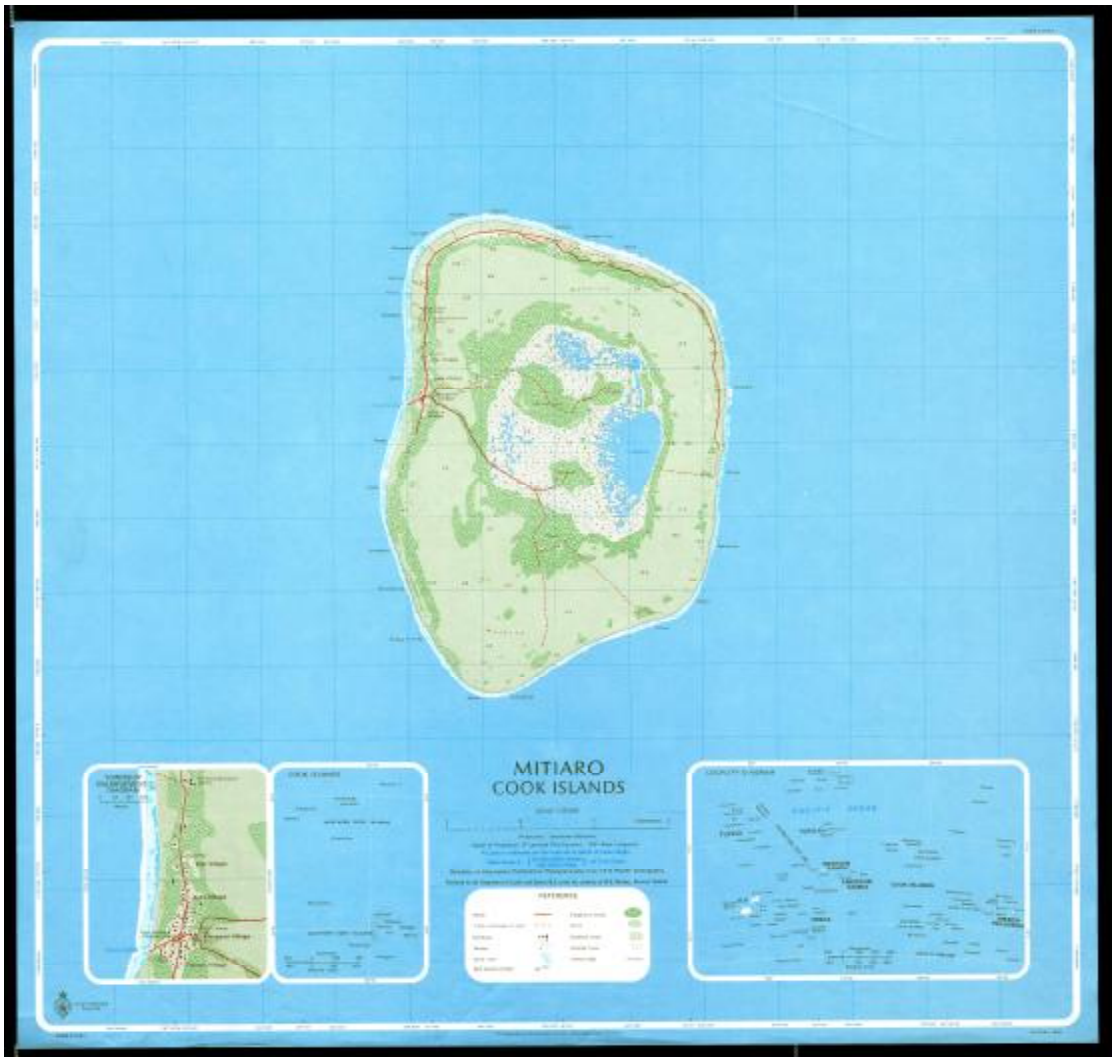
Cook Islands NBSAP Add-On Project, National Environment Service.

Project Site 1 – Mangaia Island

(Map of Mangaia)

Project Site 2 – Mitiaro Island

(Map of Mitiaro)



Glossary -

Taunga – any person who is known by his or her generation, or the people on the island where he or she resides, or the people in his or her village, or his/her family to heal any person through the making of any medicine from one or more plants and any other natural things. Also, healing of people through massage, touching, or through talking with the sick person about his or her problems.

Vairakau – a mixture or potion made by a Taunga from one or more plant and or other natural material for the purpose of healing ones illness.

Vairakau plants – plants or parts of a plant used for the making of a vairakau.

Nukuroa – The old name of the island of Mitiaro

Abbreviations -

NGOs	None Governmental Organizations
ES/NES -	National Environment service
MOA	Ministry of Agriculture
MOE	Ministry of Education
CLO	Crown Law Office
MOH	Ministry of Health
EPF	Environmental Protection Fund
CBD	Convention on Biological Diversity
NRC	National Research Committee
EIA	Environmental Impact Assessment
USP	University of the South Pacific
NHP	Natural Heritage Project
NHT	Natural Heritage Trust
IPR	Intellectual Property Right
NBSAP	National Biodiversity Strategy Action Plan
REAP	Rarotonga Environment Awareness Program
OMIA	Office of the Ministry of Island Administration
VD	Vineral Disease
CIANGO	Cook Islands Association for Non-Governmental Organizations
WWF	World Wide Fund for Nature
TIS	Taporoporoanga Ipukarea Society

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Acknowledgement

The Consultants would like to thank the Taunga vairakau of Mangaia and also of Mitiaro for donating their time as well as the benefit of their expertise to assist us with this project

Summary

Survey - Of the three plants identified by the Cook Islands Biodiversity database as medicinal and rare for Mangaia and Mitiaro (rau-ta'i, a'i and poro'iti) only the poro'iti has been confirmed, on the field, as being rare.

Survey (by the adopted method of the Natural Heritage Project to provide consistency) by looking and observing, shows that the other two plants (rau-ta'i on Mangaia and a'i on Mitiaro), as listed were not found to be rare. This is further supported by a survey of the views of the Taunga vairakau both at the island workshops and from the personal interviews.

Capacity Building Needs to conserve rare plants - In the review of project documents, namely the NBSAP document, it is noted here that it assumes that the knowledge on medicinal plants is being lost, and therefore has identified the need to "retrieve, access, and process" this information to make it quickly available as if the holders of that information are dead, dying or becoming rare or extinct. On a Taunga to population ratio, on Mitiaro and Mangaia, there is an estimated one Taunga for every 20 persons. In this respect, it is a valid question to be asked, and that is, what is the foundation for this need "to retrieve access and process this information? Mindful of the fact that some knowledge has been lost and some plants are becoming scarce, the finding of this report is that the holders of the knowledge on plants, the "Taunga", are still in tact and still practicing. Therefore, only information on what these plants are, and measures for in-situ and ex-situ conservation have been obtained.

It is also the finding of this report that without the "Taunga" there would be no "medicinal" plants. One may ask the question, who are we, therefore, collecting this information for and does this mean that we will train some Taunga in an institution that is to hold this knowledge for future generation? Is the Environment Service to be entrusted with this information and for whom? From its investigations, and using the islands of Mitiaro and Mangaia as the samples, the findings of the report indicate that the best holders of this information are the Taunga themselves, who use and therefore are the best "conservers" of, these plants. Otherwise there will be a complete institutionalization of this traditional practice. Did the Environment Service anticipate this?

The last but not the least major finding that the Consultants felt that the project did not have the right, even though the Government has international obligation to the Convention on Biological Biodiversity (CBD), to retrieve the information that it was trying to get, because by having that information available to others, the Taunga without understanding the consequences of cooperating, in the first instance, would have allowed this information to be used by those that they might have not given the information to had they known. It is to be noted that capacity building activity to inform and educate the Taunga on this process cannot be carried out fully or properly in the duration of this project.

It is also noted, if one has to consult the CBD, the Convention does recognize the way Contracting Parties, in their own right, conserve and manage their resources. To recognize the Taunga as a knowledge holder and one who is capable of sustaining that knowledge is provided for in the CBD.

With the above background, the capacity building needs analysis provides for the capacity building of the knowledge holders, the Taunga and those systems around them aimed to support them. With this thought, two priority capacity building needs activities were implemented.

Priority capacity building need 3, the preparing of the first two News Letter attached in Annex V, is to capacity build the members of the Steering Committee and staff of the Environment Service so that they understand the nature of the knowledge holders and issues involved in what the NBSAP is

trying to achieve. It is also the first capacity building material and activity aimed at highlighting the issues involved. The facilitating of the setting up of the Vaka Taunga Association on the two islands of Mangaia and Mitiaro, priority capacity building need 2, is the second capacity building activity implemented to bring the knowledge holders together for them to be able to be in contact with each other to share their experiences with regards to the conservation of medicinal plants, as well as, allowing them to practice their medicine more openly.

It is the conclusion of this report that in order to proceed with the recommendations provided in Part D the issue of intellectual property rights of the Taunga over their vairakau Maori and associated knowledge must be dealt with effectively. The lack of IPR legislation and recognition of constitutional rights of the Taunga in regards to their knowledge, which is after all their personal property, is a disadvantage to this project as well as further work in this area.

To Survey and Conserve Rare Vairakau Plants

Part A – About the Report

1.0 Introduction

It has been highlighted by the NBSAP document that there is a need to access, retrieve and process knowledge on rare vairakau plants. Further, the NBSAP document highlights that because of Government obligation under the Convention on Biodiversity (CBD) it must undertake this activity. As a result, the NBSAP Add-on project endeavors to address this identified need through the implementation of this consultancy. The tasks for the Consultant are, in summary, to identify the rare vairakau plants, survey them and provide ways to conserve them. A copy of the TOR is attached as Annex I.

This report is referred to under the Consultancy Agreement as the "Final Report". It is an overall report on the full implementation of this consultancy including an analysis of the state of capacity building and future needs to survey and conserve rare vairakau plants.

In its implementation, aside from the field investigations, the consultants met with the Steering Committee of the NBSAP Add-on project on two occasions to raise and discuss issues, including some of their findings.

During its first meeting, the outstanding issue the Steering Committee raised was in relation to traditional vairakau knowledge and intellectual property right of individuals. The Committee was not comfortable with the recording of vairakau knowledge as that information belongs to the holder. The Consultants, taking this matter into account from that meeting moved forward on the understanding that the information on traditional knowledge that the TOR was referring to was only knowledge requested to ensure the conservation of the identified plants. This does not include detailed vairakau knowledge. During that same meeting, the Consultants highlighted the issue of consistency with existing information, specifically in regards to the survey method to be used. It was accepted, for the sake of consistency with the existing method used by the Natural Heritage Project, that is "by looking", it would be appropriate to adopt the same method. The Consultants raised the issue that since most vairakau plants are found around the homes of the Taunga, a household survey could be considered, however, as there were only three rare vairakau plants identified for assessment it would be simpler to adopt the "by looking method" as explained by the NHP curator.

During the second Steering Committee meeting, the issue of Intellectual Property Rights (IPR) was discussed in some depth. While the rest of the members focused on the collecting of vairakau data (specific medicinal knowledge), the Director of ES clearly expressed his opinion, unchallenged, that holders of vairakau knowledge (the Taunga) are known to stop practicing once a vairakau becomes common knowledge to everyone. While there is the need to record this information, the project has to be sure that those currently holding that information are fully informed and they themselves see a need for it.

Mindful of the fact that this information is held through an age-old practice with its own database system of holding and transferring of information and also, in view of the lack of IPR legislation, the Consultants took as a second lead, that the knowledge holders should themselves also be analyzed and assessed and their role clearly identified. To this end, capacity-building needs were included, and the project moved on to the final stages of achieving its TOR.

The content of this final report therefore, in fulfilling the TOR, has three parts. Part A is about the report, Part B contains a process for identifying the rare vairakau plants for surveying and conservation and detailed analysis of the need identified by NBSAP to access, retrieve and process knowledge on rare vairakau plants and Part C is an analysis of future capacity needs. Attached to this report, part of the report are, two capacity building theme Newsletters (final drafts) raising the issues, future capacity building needs and include also a short report on the implementation of the first capacity building needs activity.

2.0 Methodology

2.1 Background

Having recognized that traditional knowledge, such as the knowledge on vairakau plants and their application as in the form of medicine, was developed over a long time period and passed from generation to generation, the Consultants consider it important that a high degree of respect must be given to those traditional knowledge holders (Taunga) who will contribute to the information requested under this project.

In its investigation to achieve its TOR, the Consultants followed a planned approached by clearly identifying objectives (derived from the TOR) and listing activities on how to achieve those objectives. The activities are then implemented through the conducting of a review of relevant documents, field investigation (method outlined below) and analysis and interpretation of field data collected.

During the course of the project the Consultants were in constant dialogue with the Project Coordinator and had also met with the Steering Committee.

The planned approach is outlined below:

2.2 The objectives

The objectives are:

- To survey the rare vairakau plants identified by the Cook Islands Biodiversity database and the NBSAP document.
- To collect data to allow the Consultants to analyse the status of the Taunga
- To find ways to conserve those vairakau plants (in-situ and ex-situ).
- To identify future capacity building needs to sustain the conservation of those plants.

2.3 How to achieve the objectives

A. To survey the rare vairakau plants identified by the Cook Islands Biodiversity database and NBSAP document:

Activities:

1. Review existing and relevant documents (see section 3.0 list of materials reviewed)
2. Identify the rare vairakau plants
3. Identify issues that may assist in the long-term conservation of those plants
4. Confirm with the Taunga that the rare vairakau plants are in fact rare by:
    i. Group discussion with the Taunga in a workshop
    ii. Structured personal interviews of the Taunga
    iii. Field visit.

B. To collect data to allow the Consultants to analyse the status of the Taunga

Activities:

1. Structured personal interviews of the Taunga as in A 4 ii. to collect data on the following:
    i. About the Taunga
    ii. How knowledge was transferred
    iii. Seriousness of the practice (illness (type and age and sex categories affected))
    iv. Knowledge on plants.
2. Details of each category are outlined in Section 2.1.2.
3. The data analysed and presented.

C. To find ways to conserve those rare vairakau plants (in-situ and ex-situ):

Activities:

1. Workshop (as in A 4 i.)
2. Interview the Taunga (as in A 4 ii.)
3. Interview government and non-government individuals on the issues involved and how these rare vairakau plants may be conserved.

D. To identify future capacity building needs required to conserve those rare vairakau plants.

Activities:

1. Collect data through a Workshop (as in A 4 i.)
2. Interview (as in A 4 ii. And C 3.)
3. Analyze the data collected from D1. and D2.

Part B - Investigation

3.0 Material Review

The following is the list of relevant materials and documents reviewed for this project

National Biodiversity Strategy Action Plan document, 2002
Convention on Biological Biodiversity
Cartegena Protocol on Biosafety to the Convention on Biological Diversity
NBSAP ADD-On Project document
Cook Islands Biodiversity Data base

4.0 Field Investigation

4.1 Field visit program

For Mangaia, the consultant team, visited the island twice. The first visit was from Monday 29th March 2004 to Friday 2nd April 2004. The second visit was from Monday 14th June to Wednesday 16th June.

For Mitiaro, as for Mangaia, the team visited the island twice. The first visit was from Wednesday 13th April 2004 to Friday 15th April 2004. The second visit was from Wednesday 9th to Friday the 11th June.

The itineraries and programs are attached in Annex II.

First visit - Information was collected through the implementation of a workshop and the interviewing of the Taunga (stakeholders), government and non-Government individuals for each island visited. The information was used to identify a priority capacity building activity for implementation.

Second visit – To implement a priority capacity building activity identified during the first visit.

4.2 Methods of investigation

4.2.1 Workshop

The purpose of the workshop was to bring the Taunga together for a discussion so that the consultants would have the opportunity to observe and record discussion about various issues pertaining to the objectives identified, including confirmation of the status of rare vairakau plants.

The workshop was restricted to the Taunga. At the workshop, issues that affected the use of the vairakau plants were discussed and these were recorded, analyzed and provided below.

4.2.2 Interview of Knowledge holders

Structured interviews were also held with the individual Taunga during the visits to the two islands.

The interviews were carried out in the language (Maori) of the Taunga and covered the following four (4) areas; information about the Taunga, how their knowledge was transferred to them, the seriousness of the practice (illness (type and age and sex categories affected)), and also their knowledge on plants.

The main purpose of the interview was to collect information required to achieve the objectives of the project.

The following criteria were used for designing the interview in order to cover each area:

4.2.2.1 Information about the Taunga

The purpose of this section was to determine the stability of the Taunga. Given the background that population migration due to a changing way of life is still a feature of the two visited islands, the determining of how stable the Taunga are has become very important. This is because having some idea of how stable the Taunga are will not only give us an idea of whether or not they will probably go or stay but it will also give us an indication of the Taunga's ability to retain their knowledge on vairakau plants, including those that are now rare.

It is the understanding of the Consultants that the transfer of knowledge is not an issue of formal education but that of a more personal nature achieved through, in most cases, long-term contact with a person, life experience and having the natural ability to abide by the rules of making the vairakau.

Activities:

1. In order to, maintain confidentiality of information about individual Taunga a number was assigned to each. This number was used throughout the areas covered by the interview.
2. Collected data on each Taunga such as their age, sex, spouse, number of children and income generating activities.
3. Analyse data collected

4.2.2.2 How was knowledge transferred?

Observation of the way that each Taunga communicated information, either at the workshop or during the individual consultations in their respective homes, was important. Of specific importance was observation of knowledge on identification of the vairakau plant habitat and how, freely the person was with discussion about the biology of each plant.

The purpose of this section was to identify, where and how the knowledge was transferred from place to place and the relationship of people from which the knowledge was transferred from or to. This is important to illustrate the personal nature of the transfer of knowledge. As mentioned above, the transfer of knowledge is not an issue of formal education but is of a more personal nature.

Activities:

1. Collected data on the following:
    i. The source of the knowledge
    ii. Who transferred the knowledge to the current holder?
    iii. Who did the current owner transferred the knowledge to?
2. Analyse data collected.

4.2.2.3 Seriousness of the practice (Illness type, age and sex)

The purpose of this section was to identify a category that can be used to illustrate that the use of vairakau is serious business. This was achieved by recording the type of illnesses, whether or not women or men are prone to it, and what special age groups are prone. This information is also useful

for analyzing the extent of the use of local medicine and plants that Taunga may need to have conserved. The following issues were discussed and recorded:

1. Collected data on the following:
    i. What illnesses the Taunga treats?
    ii. Who is most affected by the illness? (any person, male/female, child, teenager, adult and elderly)
2. Analyse data collected.

4.2.2.4 Knowledge on plants

The purpose of this section was to identify how knowledgeable the Taunga is about different plants. The Taunga was asked the number of plants they use, how many of them use the same plant and their suggestions on how to conserve the plants they identified.

1. Collected data on the above
2. Analysed data collected

5.0 Fieldwork - data collection and analysis

5.1 Mangaia

5.1.1 Workshop

At the workshop which was held on the 30th of March 2004, the Taunga discussed the issues under the following categories; philosophy of vairakau Maori, knowledge transfer of Vairakau Maori, and problems of being a Taunga on Mangaia.

As a working group exercise, the Taunga listed the plants that are used for making vairakau. These were categorized into the ones that are hard to find and those that are 'rare'. For those identified as rare, conservation measures (in-situ and ex-situ) were given. A definition of what 'rare' plants are is provided in Part C.

5.1.1.1 Philosophy of Vairakau Maori

1. The Power of God

The workshop unanimously agreed that the Taunga Vairakau believe in the power of god being part of the work of the Taunga. This is not considered questionable. It was also said that each Taunga has been given a responsibility and knowledge leading to life healing which comes ultimately from God.

2. The Power of the medicine

It was said by some Taunga during workshop discussions that when another Taunga gives medicine for certain illnesses, the receiving Taunga respects this gift and therefore must abide by the rules also given with that medicine. The giving Taunga gives the medicine either without any conditions or with conditions. Usually, in the case conditions are given, it is in regards to the application of the medicine. In which case the giving Taunga may only give the medicine to an individual's immediate family members or to the sick person. The giving Taunga may also give the medicine in order to make the medicine available to that island but it must always be made under the direction of the giving Taunga.

However when a Taunga gives the medicine without condition, this means the Taunga feels confidence in the receiving Taunga's ability to diagnose the patient and make the medicine.

Where the medicine is given with condition, the receiving Taunga at some time will ask for consent from the giving Taunga to practice the medicine on their own. The aura of mysticism and respect is because of profound beliefs in the power of the medicines to heal. The curing of a serious illness is considered a miracle of life.

It has been the case in the past where a Taunga did not gain proper consent to practice and the owner of the medicine died. This resulted in not only the medicine being lost but also it was unable to be practiced. This has also resulted in some plants and their names becoming lost as well.

The Taunga believe that if you practice the medicine given to you without following the rules, especially the rule regarding consent from the owner to practice, it is not the right thing to do. In some instances, the Taunga believe, the power of the medicine will be lost from the owner of the medicine. This is not considered proper behavior.

3. To heal is the important thing

To the Taunga Vairakau the healing of an illness is the most important matter. If the responsibility is given to you to make a medicine, the important thing to do is to heal the sick person. If the medicine is not yours, or you need to apply it to someone outside of the family, every effort must be made to gain consent to apply the medicine from the owner. With proper consent full knowledge about the medicine ingredients and application is assured. Application of medicines without full knowledge or without supervision is considered dangerous especially in the case of a serious illness.

In the philosophy of Maori medicine it is also important to the Taunga that when a Taunga's medicine is unsuitable other medicine must be found. In this case, the Taunga must make every effort to know each other so that there is way of knowing who else can assist and for avenues for the sick person to be directed to another Taunga for consultation.

A general and less serious example of this is the 'mimi' medicine. There are a number of different types and each one is slightly different from the other.

5.1.1.2 Knowledge transfer of Vairakau Maori

4. Passing on the Vairakau knowledge

The workshop heard that some Taunga give their medicine to anyone who is willing to practice the medicine. Some give the medicine to a person for their own personal use, which usually includes the use of the immediate family members. Some give the medicine out because they can no longer make it because of their age and/or physical abilities.

Some give the medicine to the sick person so that they can make it if the sickness occurs again.

Some give their medicine to people who will practice for them on another island. Even though this has happened the medicine often 'remains' with the owner i.e., consent and consultation is required before every usage.

The Taunga at the workshop agreed that in any case, whatever the situation is, the transfer of knowledge usually goes like below:

1. A person who is willing
2. A person who has a knack for this kind of work
3. A person with a home
4. A person who is willing to give time to help people
5. A person who does not speak against Maori medicine
6. A person who has patience or can calm himself or herself.

The Taunga at the workshop also said that mothers, who are Taunga, recognize signs that tell them which of their children or the children within their family or other families are a suitable apprentice. The mother may even know when the child is born whether or not she or he is suitable. Sometimes, however, there is no suitable person from the Taunga's family or the extended family. This may cause the medicine to be lost because there is no one to transfer this knowledge to.

At times when people do not see the Taunga, but always prefer going to a Western Medicine Doctor, medicine is not used, and is then not passed on and then it is thereby lost. Sometimes the infrequent use of these medicines not only loses the medicine, but also much of the knowledge on how to identify the plant or its habitat etc. This happens most often to young Taunga.

Sometimes also a type of sickness is no longer occurring and so the medicine for it is lost together with knowledge about the plants used for it.

5. Vairakau that comes through dreams

The Orometua told the workshop that examples of dream transfer of knowledge is written in various parts of the Bible. This is a way to pass on a message which is very important, including medicine knowledge through specially gifted people such as the Taunga. As in the Bible, he said, some of our medicines have been passed on or kept through dreams and visions.

It was agreed by the Taunga present that dream transference is one way that the medicine is passed down especially where the medicine is lost or there is a new illness.

The workshop heard from a Taunga that her medicine came through a dream she had when a close relative became very ill.

6. Directory

The Taunga discussed the importance of knowing how to contact the Taunga so that sick people are able to know about their existence and where they live.

It was also agreed that it would be useful if the name of the sickness were listed together with a description of the symptoms for that sickness. This would aid the process of quickly identifying Taunga who can help with the illness.

It would also assist other Taunga to know who their counterparts are.

The workshop also discussed the importance of being careful to ensure that the Taunga are not adversely impacted by this new idea.

5.1.1.3 Problems of being a Vairakau Taunga on Mangaia

7. Mile-a-minute

There are currently plants that are pests to farm crops or plantations. There are therefore also moves to exterminate these plants e.g. the noxious weed called the mile-a-minute. This is a very important plant, as it is known to be useful when applied to large or small cuts.

It is therefore also important to find a way to retain this plant, along with controlling them, for medicinal purposes.

8. Puaikao

The Taunga at the workshop discussed the Puaikao. It is an ingredient plant for making medicine and has been highlighted by some people who have said that this plant is becoming rare. This is why some Taunga had decided to discuss this plant.

According to one Taunga, the Puaikao is going to 'die' this month (March) until its next growing season. It is in fact not dead but just dormant or gone to sleep. Because of the cool weather, it lays dormant in its seeds. Just before this time also, if the seeds have not come out yet, the flowers have. The seeds will be in the ground until it is time to grow. Sometimes the puaikao from one place do not grow in their next growing season. Sometimes they just do not grow in a place for a while. At other times when the place where they usually grow is cleared the Puaikao will start to come out. In some or other of their growing places they will always grow. Only the Taunga who uses this plant seemed to know its processes well. And at the end of the discussion the Taunga concluded that the Puaikao is actually not becoming rare. The one who uses it in medicine spoke of several alternate places and no difficulty in obtaining it.

9. The husbands

It was discussed by Taunga at the workshop that unsupportive husbands have been one reason why some medicines have been lost. Some husbands do not support their wives when they make medicine. They object and moan about it. It is as if the medicine is unimportant 'woman's' work.

As a result of this attitude, the Taunga are discouraged from making the medicine. The Taunga also become discouraged from transfer their knowledge to their children because of fear that they will go through the same kind of life and have this kind of problem in their household.

10. Mothers feel sorry for their daughters

A Taunga shared her personal experience trying to get her mother to give her the medicine that she is now practicing. Her mother did not want her to make some of the medicines because she would rather her daughter spend her time looking after her children without added stress.

11. One plant has more than one name

In discussing the issue of rare plants, the workshop participants said that it is important for those who are recording the name of plants to note that it is common for a plant to be known by different names. It was mentioned because of the difference in the names of plants that often makes people think that a particular plant may be no longer found.

The classic example of a plant with three different names is the kokii, as it is known in Tamarua district (and Rarotonga). The same plant is also called 'tiromi' in Oneroa district and 'maramara' in Ivirua district in Mangaia.

It is therefore a very important matter for those people who are writing up these names and talking about these plants that they know all the maori names used for a plant.

12. The jargon of Vairakau Maori

This is a matter raised because it causes much ridiculing of the Taunga Vairakau Maori. Since the Vairakau knowledge, apprenticeship and practicing does not take place in a University-type institution they have a different way of explaining and describing and do not use scientific medical terminology.

An example of this was explained by one of the Taunga at the workshop. She showed the gathering 2 Tiare Maori plant leaves- the Tiare Maori is a medicinal plant. She said one of the leaves was a 'male' leaf and the other one was a 'female' leaf and she had picked them from the same plant.

The male leaf is slightly tipped at the top whereas the female leaf is well rounded. Her description has nothing to do with sexual activity she said; it simply distinguishes leaf shape. Nono fruit and Miro seeds shapes are described similarly.

This method of describing shapes becomes very important in the gathering of correct ingredients for medicines i.e., so many 'male' leaves from the Tiare Maori … so many 'female' Miro seeds etc.

There are also certain sequences to follow for making some vairakau i.e. arranging the leaves (ripe leaves then green leaves, or leaves arranged with the veins in opposite directions to each other) before they are pounded.

The issue of the jargon of the Vairakau was a matter that the Taunga felt should be brought up. Their jargon is not fashionable and at times sounds uneducated or even ignorant, but it has been the most appropriate way that old medicine knowledge has been kept.

5.1.1.4 Plants listed by the Taunga at the workshop that are used for vairakau

1. Vairakau plants

Tai-ino
Toatoa enua
Utu
Pokaara
Remene enua
Kaokao-toa
Kao-papa
Kaikai-ara
Pakiri Puka
Pakiri-toa
Aroe
Tiare maori (koakoa e te rau)
Kao-tuava
Papati
To-piavare
Tapou-tipani
Tutae-torea
Pakiri e te rau vi-kavakava
Puaikao
Kaeta
Tuitui
Roti (kura rikiriki)
Vai kere
Menemene-tai
Kao-rauti
Kaukuru
Tumu koka pe (te koka ua)
Rau-toa
Pi
Cinnamon
Rau-tuava
Moemoe
Rau-tou (para e te pi)
Kape
Tumu-enua
Mori (tea, kura)
Rau-ta'i
Tiporo

Pia (rau)
Miro
Tou
Akari
Rau kaope enua
Na'e – taviri
Cactus
Ua-fig
Kaika kura
Pati no te nu
Kakaunoterau
Tiromi, kokii, maramara
Nono
Aka ava
Pia
Miri-kura
Anu Kura
Uaua mati
Kava Maori
Mori kakara
Poroporo

2. Vairakau plants hard to find or endangered, but not rare.

Poroporo/poroiti
Remene enua
Rau-ta'i
Moemoe

3. Rare vairakau plant

Poroporo/poroiti

5.1.1.5 Measures to conserve plants that are rare

a. Poroporo/poroiti

In-situ conservation

- **ü** Plant new plants
- **ü** Look after the ones that are growing (only one is found in Ivirua) so that more can be grown from it.
- **ü** Have the Forestry division raise seedlings from the one plant in Ivirua so that they may assist by raising these seedlings for re-planting.
- **ü** Further investigation on the primary insect that is responsible for reduction of the poroiti plant to this state with the emphasis of keeping it away from the places where the plant is growing.
- **ü** Plant poroiti around the clothes line so that the soapy water from the washing regularly washes over the plant making it unattractive for the 28 spot beetle that feeds on the new leaves of the poroiti plant. This is being tried by Taunga already. They suggested this method.

Ex-situ conservation

- **ü** Identify places on other islands where this plant is found so that the Taunga on Mangaia that uses this plant may be supplied.
- **ü** Develop controlled conditions on the island where the plants can be raised to assist the Taunga to grow their own.

5.1.2 Interview of Knowledge Holders

5.1.2.1 About the Taunga

Taunga:	*Age:*	*Male/Female:*	*Number of Children:*	*Income generating*

				activities:
1	75	F	12	1, 2
2	58	F	8	2
3	50	F	3	2
4	35	F	4	2
5	42	F	6	2
6	28	F	1	2
7	74	F	11	1,2
8	66	F	8	1,2
9	32	F	3	2
10	69	F	1	1,2
11	38	F	5	2
12	53	F	7	2, 4,5
13	32	F	2	2
14	59	F	8	2,5
15	36	F	0	2
16	37	F	7	2
17	42	F	2	3
18	59	F	3	2, 5, 6
19	76	F	8	1,2

1 = Pension, 2 = Market, 3 = Paid Employment, 4 = Maire, 5 = Nono, 6 = Sewing

Analysis:

- Ø All of the Taunga interviewed were women
- Ø The average age of Taunga was 50 years
- Ø With the exception of one Taunga, all Taungas have an average of 5 children
- Ø 80% of the Taungas depend on the market (selling of craft and food) for their income. Craft activities include making ei pupu, baskets, hats etc. Food sold includes mainly tiromi and vai akari.
- Ø A total number of 19 Taunga were interviewed:
  - o 33.3% (or 5) of these are people over the age of 60
  - o 40% (or 6) of these are people in their 30s
  - o 13.3% (or 2) of these are people in their 50s
  - o 6.6% (or1) of these are people in their 40s
  - o 6.6% (or 1) of these are people in their 20s

- Ø 5% (or 1) of the Taunga depends on market and harvesting of maire and nono for their income.
- Ø 5% (or 1) of the Taunga depends on market, harvesting of maire and nono and sowing of clothes for their income.
- Ø 5% (or 1) of the Taunga depends on paid employment.
- Ø 5% (or 1) of the Taunga depends on market and harvesting of nono for income.

5.1.2.2 Knowledge transfer

Taunga	Source			Transferred from					Transferred to		
	From Outside	On island	Dream	Parents		Grandparents		Other[1]	Children	Grandch.	Others
				Mother	Father	Mama	Papa				
1		ü					ü		ü		

2	ü			ü					ü		
3		ü			ü				ü		
4		ü			ü				ü 2		
5		ü				ü			ü 2		
6		ü	ü					ü			
7		ü			ü						ü 3
8	ü							ü			ü 3
9		ü				ü			ü 2		
10	ü							ü			ü 3
11	ü							ü	ü 2		
12		ü						ü			ü 3
13		ü					ü		ü		
14	ü							ü	ü		
15		ü					ü				
16		ü		ü					ü 2		
17	ü			ü					ü 2		
18	ü							ü			ü 3
19		ü						ü	ü		

1 = From other relatives or friends * = Children have left the island 2 = Young children not ready 3 = Transferring to other willing people

Analysis:

Sources of knowledge

- 37% (or 7) have medicine knowledge transferred from islands outside of Mangaia
- 63% (or 12) have medicine knowledge from on the island
  - 5.3% (or 1) have medicine knowledge transferred through a dream
  - 94.7% (18) have medicine knowledge transferred from another Taunga

Transferred from

- 32% (or 6) of medicine was transferred to the current holders from their parents
  - 50% from mother
  - 50% from father

- 26% (or 5) of medicine was transferred to the current holders from their grandparents
  - 60% (or 3) from the grandfather
  - 40% (or 2) from the grandmother

- 42% (or 8) of medicine was transferred to the current holders from sources such as friends.

Transferred to

- 68.4% (or 13) of the current knowledge holders either have transferred their medicine knowledge to their children or are waiting for their children to come of age.
  - 46% (or 6) of the current knowledge holders are waiting for their children to come of age.

- Ø 31.6% (or 6) of the current knowledge holders have transferred their knowledge to others, including friends.

5.1.2.3 Seriousness of the practice (Category of Illness, age & sex)

Susceptibility Category:	*Illnesses with cures category*					
	Requiring in-depth knowledge to diagnose:			*Accident caused:*		
	Male	*Female*	*Both*	*Male*	*Female*	*Both*
Child[1] only	0	0	7	0	0	1
Child/teenager	0	0	1	0	0	3
Child with all[2]	0	0	0	0	0	3
Teenager only	0	0	0	0	0	0
Teenager/child	0	0	1	0	0	3
Teenager/adult	0	1	10	0	0	6
Teenager/elderly	0	0	9	0	0	6
Teenager with all[3]	0	0	8	0	0	6
Adult only	0	1	6	0	0	0
Adult/teenager	0	1	10	0	0	6
Adult/elderly	0	0	3	0	0	6
Adult with all[3]	0	0	8	0	0	6
Elderly only	0	0	0	0	0	0
Elderly with all[3]	0	0	8	0	0	6

Note: 1 = Child below 6 years of age, 2 = Plus all other age groups 3 = Does not include children. In total there were 36 different illnesses described by the Taunga of Mangaia.

Analysis:

Of the medicines for illnesses requiring in-depth knowledge to diagnose

- Ø 22% (or 8) are for children below the age of 6, this applies to both sexes, 86% are for children only and 14% is shared with the teenage age group.
- Ø 32% apply to teenagers, of this 11% is for female, with the exception of the female only illnesses, 89% are shared with the adult and elderly and 11% share with children.
- Ø 24% apply to adults only, of this 11% is for female
- Ø 22% are for elderly people, this is shared all and with both sex

5.1.2.4 Knowledge on plants

Taunga:	*Specific medicinal plants*	*Number of plants*
1	Kaope-enua, remene-enua, tiare-maori, mori, poroiti, oporo	6
2	tai-ino, tuitui, papati, puapua au, rauti-enua, cactius	7
3	puaikao, maramara, kava-maori, tuitui, tou	5
4	na'e, tutae-torea, tiare-maori, ava, pia,	5
5	pokaara, moemoe	2
6	nu-kura, aroe-nira	2

7	utu, koka-tarua, kuru	3
8	puaikao, tomakaakaa	2
9	Kapila, tumu-enua, moemoe, poroporo, tuitui	5
10	Pokaara	1
11	tuitui, tiare-maori	2
12	rau-ta'i,	1
13	ara-tai, mati, tuitui	3
14	puaikao, ava, miro, tiare-maori	4
15	miro, tou, kaika-kura, vaikere	4
16	menemene, vai-kere, roti-kura	3
17	tiare-maori, mori, vai-kere, toatoa-enua, mautini	5
18	tuitui, utu, tou, nono, miro	5
19	nono, miro, tou, a'i[1]	4*
Total		69

1 = From Mitiaro * = Had no knowledge of where it grows and what it looks like, therefore not included.

- On average the Taunga have knowledge of at least 4 plants
- The most used plant is the tuitui, followed by tiare-maori and nu or coconut, then miro and tou, puaikao, then mori, ava, pokaara, moemoe, utu and nono. The rest of the plants, 28 in total, including poroiti, and rau-ta'i, are used by only one Taunga.
- From the lists of plant types that are used by more than one Taunga, 6 are trees, 3 are herbs and 2 are shrubs.

5.1.3 Interview of Government and Non-Government Individuals

5.1.3.1 Government Individuals

Unlucky Tungata

Mr. Tungata is an employee of the Ministry of Agriculture. In relevance to this project, he is the chairman of the German funded GTZ Committee. This program included the replanting scheme of plants used traditionally either for medicine or for construction. Such plants as Tou, Tamanu and Miro were planted during the implementation of this project. This program also included the planting of the sandalwood, the New Caledonian variety.

In terms of the problems with certain medicinal plants that are hard to find such as the poroiti, GTZ may be able to assist through giving advice and perhaps involvement in a committee type of arrangement due to their limited personnel. The poroiti (relative of the tomatoe plant, the chili and also the egg plant) is attacked by the 28 spot ladybird. The ladybird is the most common pest for the plants mentioned and was also a new introduction over 10 years ago, but is now commonly found in the Cook Islands.

Peter Ngatokorua

Mr. Ngatokorua is an employee of the Ministry of Education and Principal of Mangaia College.

In relevance to the project, Mr. Ngatokorua outlined the need to introduce into the school, especially the senior classes, as part of their environmental and conservation activities, pictures of medicinal plants including those that are hard to find and that are rare (defined in Part C of this report).

According to Mr. Ngatokorua, the students and teachers have no idea what most of those plants look like.

As an activity, the students could learn on how to identify those plants, find out where they live (habitat) and study them. As an extension of the identification activity, the Ministry of Agriculture together with the students could propagate those plants and get involved in a planting scheme to keep the plant numbers up.

And if a more technical survey method is to be developed in the future, involvement of the school teachers and students is an added advantage to his program in the school.

As a final contribution Mr. Ngatokorua added, the re-introduction of the rupe onto Mangaia should be investigated. The rupe is one animal that could spread the seeds of plants, including medicinal plants.

Nuku Raumea

Mr. Raumea is an employee of the Forestry program of OMIA. His division has kept 10 of the original workforce of the Forestry program under the Ministry of Agriculture.

In relevance to this project, the Forestry program has, under the financial assistance of the German Aid GTZ, raised and planted seedlings of Tamanu, Tou and Miro to provide and re-stock the depleted natural stocks of those species. The program still maintains a nursery facility that is currently active.

In relation to this project, the Forestry program, depending on the availability of funds, may be able to assist by raising seedlings of the poroiti for distribution and planting.

Any other plants that need re-planting or to have its numbers increased can be targeted.

The Forestry program can also be engaged to do in a survey. Again this depends on the financial assistance this project can provide for such a program.

5.1.3.2 Non-Government Individuals

Tanga'eo Rangers

Mr. Allan Tuara is the Manager of the Tanga'eo Rangers, an NGO affiliated with the Rarotonga Environment Awareness Program (REAP).

Having members age from 7 to 17, the Rangers carry out community environmental activities that they enjoy doing. It is almost like an outing where the members at the end of the day enjoy a treat with some kind of foodstuff.

In relevance to the project, the Tanga'eo Rangers have the potential to be involved in looking for vairakau plants that are hard to find and if need be get involved in the surveying and replanting schemes. As most medicinal plants are found around homes, conservation activities will be a close to home type of activity suitable for that age group.

5.2 Mitiaro

5.2.1 Workshop

At the workshop which was held on the 14th of April 2004, the knowledge holders discussed the issues under the following categories; the right of a Taunga, plants that have disappeared, transfer of knowledge, family support for Taunga, and the a'i plant specifically.

As a working group exercise, the Taunga listed the plants that are used for making vairakau. These were categorized further into the ones hard to find and those that are rare (defined in Part C of this report). For the rare category, conservation measures (in-situ and ex-situ) were provided.

5.2.1.1 The Right of a Taunga

1. The right of a Taunga to practice

The Taunga at the Mitiaro workshop expressed, even though they have been practicing their medicine without thinking about the law and how it may be against what they are doing, it may be a good thing to confirm with Government that they are indeed not breaking any law.

To them the medicine that they are practicing is an important part of the life of people in Mitiaro. Even though the young people are seeing the Western Medicine doctors, in the end they always have to come back and use the local medicine. So it is important that their right to keep on practicing is confirmed.

5.2.1.2 Plants that have disappeared

2. Plants that have disappeared

The workshop heard from a Taunga that he is happy with what the Ministry of Agriculture has done by re-introducing the kava-Maori plant from outside of the Cook Islands.

According to the Taunga, he received his cuttings from Mangaia and has now raised six plants. Once their growth has stabilized he will give cuttings out to people to grow so that the plant is re-introduced onto the island. This plant, according to this Taunga, disappeared from the island of Mitiaro some time ago now.

The Taunga further informed the workshop that, he is practicing his father's medicine, which includes the kava-Maori as one of the ingredients.

The workshop also heard that, the poroiti, another plant that has disappeared, is in the process of being re-introduced with seedlings which are now available at the Ministry of Agriculture nursery. The seeds used came from New Zealand. The information given was that, the seed came from plants that were grown from poroiti seeds that came from a poroiti fruit taken to New Zealand sometime back by a Mitiaro women to make ei in New Zealand. The return of the traditionally used variety was made possible through the Ministry of Agriculture.

Poroiti plants are now available at $5.00 a plant.

3. Two medicinal plants that are now lost

The workshop heard that there are two species of grass used for medicine that are now no longer found on the island of Mitiaro. The plants are the matie-Maori and the parango-maori. There was no

clear description of the matie-maori but the parango-maori is similar to the present parango, only it does not have a prickly seed.

According to the two Taunga who raised the matter, perhaps a similar scheme to that of the kava-Maori and the poroiti can be carried out to re-introduce these two medicinal plants, now lost from Mitiaro.

5.2.1.3 Transfer of knowledge

4. Passing on the knowledge

Passing on of the knowledge was an important matter to those that attended the workshop. They said that the type of person receiving medicinal knowledge is very important and the following are some of the criteria that they said are considered:

1. One who is not too lazy to do it
2. One who is willing to practice the making of the medicine
3. One who does not object to Maori medicine
4. One who wants to help people
5. One with patience

The workshop also heard that most of the Taunga train their own children to carry on their medicine.

5. Nurse – Support from the nurse

The workshop heard from two nurses who attended the workshop that they support the local medicine. They support all the medicine that are externally applied, as well as those medicines that are used to alleviate high blood pressure, diabetes and those medicines that deal with first aid type of things like cuts, swelling from bruises etc.

6. Directory

The Taunga expressed some support in the directory idea and that it is important for sick people to know who to go to and who to go and see. It was also raised that, if Government is supportive of this idea, then Government should also support, financially, any person that becomes sick and need to see a Taunga on another island. Pretty much the same thing as when one person is referred to New Zealand in a case where no treatment can be found in the Cook Islands.

The workshop participants raised the question-if patients are referred to New Zealand at the expense of Government, why can't this be done between islands in the Cook Islands?

7. VD

The workshop heard from a Taunga of how her father did not pass on a medicine for the illness of VD because of the difficulty in making that medicine. If the medicine is wrongly mixed this could be fatal to the patient.

According to the Taunga, not only you will loose a good medicine in this way but also the knowledge on the plants could be lost as well.

5.2.1.4 Family support for Taunga

8. Support in the family

The workshop heard of the support within the family in Mitiaro by both husband and wife making the medicine. If the Taunga is a woman, the husband, when the wife is unable to, will make the medicine. This arrangement also happens if the Taunga is a man.

This is one way that the knowledge is supported, maintained and passed on.

5.2.1.5 The a'i

9. The use of the a'i

In discussion with some of the Taunga, it appeared that most of the medicine that uses a'i is from Taunga who are not from Mitiaro. According to the Taunga, most requests for this plant have come from Aitutaki. The question of the origin of those medicines was raised. Some said, it may be that this medicine originated from Mitiaro but has been passed on to people outside either through friends or family members that have married and moved or else some other means.

10. Is a'i rare?

According to Tokai, the Agriculture Officer for the island, there are more than 100 plants of the native a'i on the island. These native a'i plants have spread and have now covered a large area, with approximately 117 stems (>100 stems at Vaia'i, approximately 10 stems at Kaapoto and approximately 7 stems at Vaitamaroa) .

According to the, Mitiaro Agriculture officer, experts during a recent workshop on the sandalwood, confirmed that the Mitiaro variety of sandalwood reproduces through its roots which is sometimes referred to as cloning. Mr. O'thaniel Tangianau, a coordinator of the workshop on Sandalwood (interviewed back in Rarotonga) said as such the plant roots make their way through the makatea rocks and that is how the plants have spreads through the harsh terrain that they are growing in. Mr. Tangianau also indicated that they are on the lookout for hybrid species that may arise as a result of the introduced variety from New Caledonia. On the question of whether or not a new variety may contaminate the native variety, Mr. Tangianau said as the native variety spread by the roots this is not probable but the impact of the introduced competition may be an issue.

During a field visit by the Consultant, it was observed that the plants have achieved extensive coverage and most definitely there are many, many more than four plants. A branch that was grafted was removed for transplanting during this visit.

5.2.1.6 Rare Plants

11. How do we teach something about rare medicinal plants in the schools?

According to the School Principal, the material should be at three levels. Level one for lower primary should just focus on plants that are important for making medicine. This should cover things mainly the names and visual identification.

Level two for the middle primary should focus more on where these plants grow.

Level three for senior primary should focus still more on the growing habits of those plants i.e. competition as well as how they grow.

12. Survey of rare plants

Having identified that most medicinal plants are found close to the homes of Taunga, it is confirmed that a survey method to be used for the rarer plants should be in the nature of a household type survey where each Taunga will mark on the household survey map the rare plants. This could then be updated regularly.

5.2.1.7 Plants listed by the Taunga at the workshop used for vairakau

1. Vairakau plants

a'i
tou
nono
paka
toa
kuru-maori
rauti (matie, kura, muramura)
mario
nuroa
matakura
kauta-enua
tureimangamanga
pohutukava
nga'u
mauku-puakatoro
ara (aratai, arakura)
kaiara
puapua
kamika
tai-noka
pueikao
kokii
turina
vi-kavakava
tiare-moe
mautini-maori
matie-maori
renga
pikimato
tuava
tauri-au
anani-maori
kava'au
miro
kaika-maori
tuitui
utu
tiare-maori
to-piavare
keketa
toatoa-enua
kava-maori
remuremu-vai
ngangie
moemoe
parango-maori
matie-piripiri
vi-puaka
piriarero
poroporo/poroiti
tai-inu
naunau
nu-uri
kopui
turou-tou
pi
i'i
miri-kura
kapukapu
makurata/taramea
oa
pia-maori
oronga

2. Vairakau plants hard to find or endangered

kava'au
kava-maori
Parango-maori
Matie-maori
Poroporo/poroiti
Kamika

Mautini-maori
Pi
Tiare-moe
3. Rare vairakau plant

Poroiti
Matie-maori
Parango-maori

5.2.1.8 Measures to conserve plants that are rare

1. Poroporo/poroiti

In-situ conservation

- **ü** Replanting scheme and planting amongst other plants such as the miri and lily
- **ü** Plant where they used to grow and around areas of the home where soap is used such as the wash-house, outside the kitchen, outside the toilet or under clothes lines.
- **ü** Find ways to deter the 28-spot beetle bug, preferably a method that does not involve chemicals.

Ex-situ conservation

- **ü** The planting of poroiti in a controlled environment, such as the Agriculture nursery at the school.
- **ü** Further investigation would be required by the Agriculture Officer to find out how the nursery environment can be used to assist the raising of the plant and for the nursery to become a supplier of the plant when needed. It is noted that the plant fruit is also a popular component of the local ei.

2. Matie-maori/Parango-maori

Ins-situ conservation

- **ü** It was confirmed at the second workshop of the Taunga held on the 10th of June 2004 that these grasses are no longer found on the island of Mitiaro. The Taunga who used these grasses suggested that some effort be made to identify if these grasses are on any other islands of the Cook Islands or elsewhere and to have these two plant species reintroduced to Mitiaro.
- **ü** To identify the plant, the Taunga will have to travel to the other islands starting with the neighboring islands of Atiu and Mauke and then if need be on to Aitutaki, Mangaia and Rarotonga.

Ex-situ conservation

- **ü** It is to be noted here that the ex-situ conservation method is in the context of on other island not affected by the pest that affected the plant on Mitiaro Island, or else in a controlled environment, such as a nursery, and also, if the plant is identified on another island, it would be conserved on that island for the Taunga of Mitiaro.

5.2.2 Interview of Knowledge Holders

5.2.2.1 About the Taungas

Taunga:	*Age:*	*Male/Female:*	*Number of*	*Earning:*

			Children:	
1	33	M	6	3
2	51	M	2	3
3	53	F	9	3
4	51	F	8	3
5	72	M	6	1
6	50	M	12	3
7	72	F	14	1,2
8	65	F	9	1
9	63	F	11	1,2
10	64	F	12	1,2
11	53	F	10	3
12	53	F	7	3

1 = Pension, 2 = Craft, 3 = Paid Employment (Rotational work and include picking Maire)

Analysis:

- Ø 33% (or 4) of the Taunga are men, 67% (or 8) are women
- Ø The average age is 58 years
- Ø All Taunga have family and have each, a family size, on average, of 9 children
- Ø 58% (or 7) of the Taunga depend on paid employment for their source of income.
- Ø 25% (or 3) of the Taunga depend on pension and craft selling.
- Ø 17% (or 2) of the Taunga depend on pensions alone.

5.2.2.2 Knowledge transfer

Taunga	Source			Transferred from					Transferred to		
	From Outside	On island	Dream	Parents		Grandparents		Other[1]	Children	Grandch.	Spouse
				Mother	Father	Mama	Papa				
1		ü					ü		ü		ü
2	ü							ü			ü
3		ü		ü					ü *		
4		ü		ü	ü				ü *		
5	ü					ü			ü *		
6		ü			ü				ü		ü
7		ü							ü		
8		ü			ü				ü		
9		ü			ü				ü		
10	ü						ü		ü		ü
11		ü		ü					ü *		
12		ü		ü							ü
Total	3	9		4	4	1	2	1	10		5

1 = From other relatives or friends * = Children has left the island

Analysis:

Source of knowledge

- Ø 25% (or 3) of the medicine knowledge was transferred from off the island of Mitiaro
- Ø 75% (or 9) of the medicine knowledge was transferred from on the island of Mitiaro

Knowledge transferred from

- 67% (or 8) gained medicine knowledge transferred to them from their parents
  - 50% (or 4) from mother
  - 50% (or 4) from father

- 25% (or 3) of medicinal knowledge transferred to the current holders came from their grandparents
  - 67% (or 2) from the grandfather
  - 33% (or 1) from the grandmother

- 8% (or 1) of medicinal knowledge transferred to the current holders came from other sources.

Transferred to

- 83.3% (or 10) of the current holders have transferred their knowledge to their children.
  - 40% (or 4) of the children that the knowledge has been transferred to have left the island.
  - 30% (or 3) of the current knowledge holders have transferred the knowledge to their spouse as well.

- 16.7% (or 2) of the current holders transferred their knowledge to their spouses.

5.2.2.3 Seriousness of the practice (Illness category, age & sex)

Susceptibility Category:	*Illness category*					
	Requiring in-depth knowledge to diagnose:			*Accident caused:*		
	Male	*Female*	*Both*	*Male*	*Female*	*Both*
Child[1] only	0	0	3	0	0	0
Child/teenager	0	0	0	0	0	0
Child with all[2]	0	0	2	0	0	1
Teenager only	0	1		0	0	0
Teenager/child	0	0	0	0	0	0
Teenager/adult	0	1		0	0	0
Teenager/elderly	0	0	0	0	0	0
Teenager with all[3]		0	6	0	0	3
Adult only	1	1	0	0	0	0
Adult/teenager	0	1		0	0	0
Adult/elderly	1	1	8	0	0	1
Adult with all[2]	0	0	2	0	0	3
Elderly only	0	0	0	0	0	0
Elderly with all[2]	0	0	2	0	0	3

Note: 1 = Child below 6 years of age, 2 = Plus all other age groups, 3=Does not include children. In total there are 27 different illnesses described by the Taunga of Mitiaro.

Analysis:

Of the medicines for illnesses requiring in-depth knowledge to diagnose

- 19% (or 5) are for children below the age of 6, this applies to both sexes, 60% are for children only and 40% are for all age groups.
- 30% apply to teenagers, of this 25% is for female (of which 50% are for teenage females only), 75% are for adults and elderly.
- 44% are for adults, of this 13% are for adults only (of which 50% are female and 50% are male), 7% are for teenagers and are for females, 53% are for the elderly (10% females and 10% males) and 13% are for all except children.
- 7% are for elderly people, this applies to all including both sexes.

5.2.2.4 Knowledge on plants

Taunga:	*Specific medicinal plant*	*Number of plants*
1	To-piavare, akari-uri, tiare-maori	3
2	Moemoe, utu	2
3	Piripiri, akari, nono, toatoa-enua, puapua, nu-uri, popoa-nu	7
4	Tiare-maori, tou, puaikao, poroiti	4
5	Kuru-enua, miri-kura, renga	3
6	Akari, kaika-maori, utu, nono, tureimangamanga, tiare-maori, nu-uri	7
7	Tumu-enua, ava, tiare-maori, tureimangamanga, tureiaua, anani-maori,	6
8	Nuroa, mautini	2
9	Kava-au, tiare-maori, akari-tiare, ara-tai, tou, tuitui, vi-puaka	7
10	Kava-au, pohutukava	2
11	Tureimangamanga	1
12	Kava-maori, miro, tiare-maori, keketa, nono, akari, vi-puaka	7
Total		51

- On average the Taungas have knowledge of at least 4 plants
- The most used plant is the nu or coconut, followed by tiare-maori, then nono and tureimangamanga, then vi-puaka, kava-au, tou and utu. The rest of the plants, 22 in total, including poroiti, are used by only one Taunga.
- From the lists of types of plants that are used by Taunga, 3 are trees, 1 herb and 4 are shrubs.

5.2.3 Interview of Government and Non-Government Individuals

5.2.3.1 Government Individuals

Mr. Teokotai Topa

Mr. Topa is an employee of OMIA and the head of the public service on the island.

Mr. Topa plays an important role in the work of the Taunga. His policy as Island Secretary is that if, in the public service on Mitiaro, the service of any Taunga is required during working hours, the Taunga is released from work to make the vairakau. This policy has been on since he became the Island Secretary. A number of Taunga have praised Mr. Topa for this policy.

In terms of assisting the Taunga to remain employed and stay on the island, over 50% of the Taunga are employed by Government, Mr. Topa was instrumental in the rotational employment scheme now in place in Mitiaro. After the economic crisis in 1996 when the public service was down-sized, Mitiaro adopted the scheme whereby instead of laying off most of its workforce, it retained them by providing them employment on a two-weekly rotational system i.e. one week working and one week at home.

Mr. Topa recommended that, in view of the seriousness of the practice of Maori medicine for health care, especially on islands where there is no doctor, and in the case of giving the Taunga real support, the contracting of Island Secretaries or Homs by PSC may be looked at so that this support is reflected in their contracts. He commented that another Island secretary after himself may not have the same policy as he has and the practice could be discontinued or, again, pushed back to the back door like before.

Mr. Tokai Ngaiorae

Mr. Ngaiorae is an employee of the Ministry of Agriculture. His main function is to assist the growers and where possible and when funds are available to raise seedlings of plants that are of importance to the community for growing. At the time of this interview Mr. Ngaiorae had successfully raised seedlings of the poroiti plant which are now ready for household owners and Taunga to transplant.

In relevance to this project, Mr. Ngaiorae has the capability to undertake nursery development when the need arises and also with the assistance of the Taunga identify vairakau plants that are becoming endangered in order to monitor their growth and distribution. He will also assist the Taunga in the implementing of programs of both in-situ and ex-situ conservation.

If funding is available and in relation to this project, he can be utilized by the Taunga to implement programs for looking after any area that may be used conserving the existence of a vairakau plant or plants.

Relevant to this project also during a field visit to the site where the a'i plant is found, Mr. Ngaiorae advised the Consultants that there are more than four a'i plants on the island and in fact there are more than 100 mature a'i plants on the island. During the visit a grafted branch was removed for transplanting in the village area. This was the start of a program that has already been instigated to plant more plants closer to the settled area.

Any other plants that need re-planting or to have their numbers increased can be targeted for this type of program.

The program can also include a survey program. Again this depends on the financial assistance the project can provide such a program.

Mr. Nooroa Pouao

Mr. Pouao, an employee of the Tu'anga Taporoporo strongly supports this project and the programs that it will bring afterwards.

Already he is assisting in the promotion of the development by the Ministry of Agriculture of seedlings of local plants to be replanted not only for medicinal reasons but also for construction and carving.

During the course of this project, he has coordinated and encouraged, through the information that he has received on the project and also from his own beliefs, the practice of maori medicine..

5.2.3.2 Non-Government Individuals

Mrs. Toru Putiare

Toru is the President of the Child Welfare Association on Mitiaro. She expressed that all the mothers have used vairakau Maori during the course of their pregnancy, during child birth and after child birth. The nurse from the hospital monitors the situation from their view point but all the mothers use vairakau Maori.

It is also for this reason you will find that all the households have vairakau plants growing around their homes. Not every mother or household have a Taunga but when the need arises, the Taunga do not have to look for the vairakau plants elsewhere or bring it with them. This view is fully supported by the data collected from the interviews with the Taunga.

The Child welfare is therefore a direct beneficiary of this program

Tou Ariki

As one of the three Ariki of the island, and comprising a third of the decision making section of the island, Tou clearly expressed his support to the Consultant of this program. Through him, there is support by the traditional making decision process of the practice and any other programs to promote the use and replanting of vairakau plants for health care.

6.0 Interpretation of Field Data

6.1 Mangaia

(i) To survey the rare vairakau plants identified by the Cook Islands Biodiversity database and NBSAP document. – For the island of Mangaia the Cook Islands Biodiversity database and the NBSAP document identified two rare vairakau plants. They are the rau-ta'i and the poroiti. Through the workshop, the data collected from interviewing of the Taunga and field visit it is confirmed that there is one rare vairakau plant on Mangaia. The rare vairakau plant is the *poroiti*.

The rau-ta'i as identified by the two documents mentioned above is not rare but one that is only known to one Taunga who also knows where the plant is found in abundance.

The poroiti, however, is in a state of completely being lost. Only one living plant was identified and confirmed on the island. Conservation measures, both in-situ and ex-situ, are outlined in section 5.1.1.5. Other considerations are mentioned in (iii) of this section.

(ii) To collect data to allow the Consultants to analyze the Status of Taunga – With 19 Taunga still practicing, despite the lack of formal recognition by authorities, the traditional practice of Maori medicine is still thriving.

About the Taunga - Although all of the Taunga who attended the workshop and interviewed were women, of the 32% who received their knowledge from their parents, 50% were from the father. And of the 26% who received their knowledge from the grandparents, 60% received their knowledge from their grandfather. Clearly, being a Taunga is not traditionally predominantly a

women's work. The current trend of women predominance is recent and may be attributed to the more recent social attitudes of men, or the home and earning situation.

It is noted that 80% of the Taunga depend on market (selling of craft and food) for their income. Craft activities include making ei pupu, baskets, hats etc. Food sold includes tiromi (made from taro) and vai akari (nu). These are the activities that are commonly undertaken by the women in the homes of the island.

Knowledge transfer - The average age for the Taunga is 50 years. The average family size is 5 children. This is not only an indication of the level of maturity of the Taunga but, also, an indication of the vast life experience they have been through which supports their practice for members of their family and others around them. By today's standards, this is a large family size. Maturity allows for the knowledge to be passed down properly and the large family size provides the chance that the right child is available to take on the knowledge. As is listed in the analysis and workshop issues table, the knowledge transfer has to take place when the right person is identified.

It is noted that, 40% of the Taunga who attended the workshop and were interviewed were in there 30s showing that Taunga knowledge has been transferred to younger people. It is noted also that knowledge is being transferred in the traditional manner, with 68.4% of the current holders either already having transferred their knowledge to their children or they are waiting for their children to reach their beginning age of 6 years.

Transferring of knowledge to other relatives and close friends is also a feature. Of the Taunga interviewed, 31.6% transferred their knowledge to their friends. Of the current knowledge holders, 37% received their knowledge from outside of Mangaia, and 42% came from sources such as friends. So clearly, the transfer of knowledge in the traditional manner is being continued.

Transfer of knowledge through dreams is rare but very important. According to the belief of the Taunga, medicines are brought back through dreams or new medicines are introduced to cope with the modern day illnesses. The Orometua who attended the workshop from Oneroa CICC has supported this and one such Taunga attended the workshop. All the Taunga believe in this method of knowledge transfer.

Seriousness of the practice - The belief in the supernatural amongst the Taunga with regards to their medicine is strong. This provides the basis for commitment to practicing and it basically recognizes that the power to heal come from god. This is a strong indication of the degree of seriousness of the Taunga in the medicine that they are making. If they no longer practice due to extreme economic and social pressures, the knowledge on the plants will be lost. As mentioned above, most of the Taunga depend on craft and goods for selling at the market for their income which is, in the opinion of the consultant, stable and sustainable. This situation provides an atmosphere that calms them and allows them to practice. Perhaps, if they were employed, the pressures of work may cause them to discontinue their medicine.

The support by the Orometua of the concept of passing of knowledge through visions and dreams is a significant contribution to the seriousness of the work of the Taunga. Like the other islands of the Cook Islands, religion has played a major role in the life of the people of Mangaia. Although some religious practitioners (i.e. other Orometua) are known to rubbish our vairakau Taunga, this particular Orometua has openly supported the work of the Taunga.

The technical jargon used by the Taunga shows also the seriousness of the work of the Taunga. It is noted that the Taunga have their own technical jargon for their medicine. They provide detailed descriptions of quantity and the right times to collect ingredients for their medicine. In the making of

the medicine, the arrangements of ingredients also indicates the complexity of the knowledge that is only known to the practicing Taunga themselves. There is also the matter with regard to the difference in the names of the same plant. These are technicalities that are used by the Taunga, much like the Western Doctors use in their training.

Knowledge on plants - On average, each Taunga has extensive knowledge on at least 4 vairakau plants. From the discussions, it is inferred that some important herbal plants are usually very sensitive to changes in the environment, whether man induced or natural. It seems that only the Taunga have knowledge of this and they do accept that some plants have disappeared. The puaikao case can be used to illustrate this point. In the case of the tutae-torea, the plant has developed resistance to the herbicide used by growers around the taro planting areas.

It is now common knowledge that there is an alarming rate at which large numbers of plants are being lost from the ecosystems of the world because of changing climatic conditions and the use of chemicals and pesticides, and also changing land use practices. These are not the result of Taunga loosing knowledge but the plant themselves becoming scarce.

It is noted that, the most used plant on Mangaia is a tree called, the tuitui, which is most common on the island throughout the undeveloped makatea and also close to settled areas. It ha been suggested by the Taunga that this is an indication that the origin of the medicine is local and is old. This is also an indication of how old and strong the Maori medicine practice has been, despite the lack of recognition by the local authorities. It has survived changes and development over many generations. It is also noted from the listed plants that the Taunga vairakau use plants that grow naturally close to their homes or that they or their parents have planted close to the house.

Analysis

It is noted that social and economic pressures have taken a toll on this age-old practice. Mothers are reluctant to pass on their knowledge due to difficulties in dealing with the demands of a particular medicine. There is the issue with the family support for the Taunga. The Consultant's opinion is that this is more because of the lack of formal support and recognition of this age-old practice. Taunga are still making medicine 'in the back' and are still being referred to as witch doctors. Although there is support for the publication of a directory for the Taunga and what illness they can heal, it is a fact that Taunga still do not practice openly. The issue of what the impact will be of increase visits to the Taunga who usually makes medicine on average once a month has not yet been analyzed in detail.

Although there are issues surrounding the vairakau Maori it is confirmed here that the Taunga, the knowledge holders of traditional knowledge on medicine and vairakau plants, are not becoming few, rare, or extinct.

One must also note the seriousness of the practice and to try and just retrieve access and process information from the Taunga without proper training and without properly informing Taunga about where this information is going and what it is to be used for is not ethical.

From the data compiled for this report, it is much more appropriate to build up the capacity of the Taunga so that information is properly acquired and consented to and it is inappropriate to rush this matter.

It is therefore confirmed that there is a need to capacity build the Taunga so that they are better informed of what they are being subjected to by the NBSAP document.

There is an urgent need to protect their individual rights, recognize them and undertake the appropriate capacity building measures not only to ensure consolidation of the practice and transfer of knowledge in the traditional manner but also support through measures to assist them in the area of conserving the rare vairakau plants (in-situ and ex-situ). This also includes capacity building those people around the Taunga who are the beneficiaries of the medicine.

(iii) To find ways to conserve those rare vairakau plants (in-situ and ex-situ) – The poroiti plant, according to the Taunga and the Agriculture Officer, disappeared about 10 years ago. According to other sources, this disappearance commenced more than 10 years ago and coincided with the time when chili and eggplants were introduced and planted in great numbers. According to the Agriculture Officer, the ladybird bug was introduced around about the same time. It is observed that the production of both crops has now become almost non-existent and it is the opinion of the Consultant that the occurrence of as few as one plant, and the possibility of another somewhere else, may have been an indication that the pest, the ladybird bug might have decreased in population in parallel due to limited food sources.

Having stated the above, in-situ conservation measures listed in 5.1.1.5 requires monitoring the one plant that is currently growing to ensure that its fruits reach maturity. This will allow the forestry nursery to produce more seedlings for replanting.

In the case, however, that the known pests may continue to attack the plant, the introduction of poroiti from outside of Mangaia may have to be looked at as a viable alternative. It was also mentioned by a Taunga that in growing her poroiti, once the seedlings reached three inches high, the whole bed of plants was virtually stripped overnight. With this carry on, possibility of tissue culturing may need to be carried out to ensure the survival of the right type of poroiti and for it to be able to be transferred to another island from the island that it can be grown successfully on.

If the poroiti remains in low numbers, ex-situ conservation measures may have to be considered by identifying healthy populations on the other islands and by ensuring that pests like the ladybird bugs are not introduced to those islands. Growing the poroiti in a controlled environment may also need to be considered.

Modern biotechnology could be looked at in the case of the poroiti to find a solution to ensure the survival of this vairakau plant. However, as we do not have the facility for such a research option, this is a recommendation for the future.

(iv) To identify future capacity building needs required to conserve those rare vairakau plants – Although there is only one rare vairakau plant identified by the Consultants, the findings of this report have expressed the need to protect the Taunga, to encourage this age-old practice as a means to ensuring that other plants do not become rare. To do this, it is apparent that the capacity building activities must take the form of institutional strengthening, (Te Vaka Taunga Society and the Education Ministry) technology to transfer knowledge (encourage the traditional transfer of knowledge system), the law (Te Vaka Taunga Society), training of people (community and Government people to understand the role of the Taunga), funds to keep the activities going and also the management of information.

The capacity building activities are provided in Part C of this report

6.2 Mitiaro

(i) To survey the rare vairakau plants identified by the Cook Islands Biodiversity database and NBSAP document. – The Cook Islands Biodiversity database and NBSAP document identified two

vairakau plants that are rare on the island of Mitiaro. They are the a'i and the poroiti. Through the workshop, the data collected from interviewing of the Taunga and field visit, it is confirmed that there is one vairakau plant that is rare and two extinct plants not identified by the NHP database, but identified at the workshop by the Taunga. The rare plant is the *poroiti*. The two extinct species are the *matie-maori* and the *parango-maori*.

The a'i as identified by the NBSAP document to be not only endemic to the island but also rare. Field investigation shows that there are more than one hundred plants growing on the island.

Poroiti on the other hand was identified by the workshop as being completely wiped out by the ladybird bug. While on the island, the Consultants observed a nursery of poroiti seedlings ready to be given out for transplanting. The poroiti seedlings came from a poroiti plant in Auckland where a Mitiaro women had them growing for making ei. The poroiti plant was originally taken from Mitiaro for making ei. Conservation measures, both in-situ and ex-situ, are outlined in section 5.2.1.8. Other considerations are mentioned in (iii) of this section.

The two extinct grasses need to be investigated further, and measures to undertake this investigation are outlined in section 5.2.1.8 where it is suggested that a search be carried out on the neighboring islands and other islands of the Cook Islands.

(ii) To collect data to allow the Consultants to analyze the status of the Taunga – There are 26 practicing Taunga on the island, 21 women and 5 men. Despite the lack of formal recognition by National Government Authorities, the traditional practice is still intact and thriving. The Taunga have been practicing without any legal information or consideration of legal consequences.

About the Taunga – Of the 26 practicing Taunga the Consultants randomly interviewed only 12 due to time limitations, for the purpose of this assessment. Of those interviewed, 58% of the Taunga depend on paid employment for their source of income and 42% depend on pension and craft. It is mentioned here that unlike Mangaia, there is support from the Mitiaro Island Administration for the Taunga to make their medicine when the need arises especially during the working hours.

With an average age of 58 years, it is not surprising that a significant portion of the Taunga depend on pension and craft. Craft work involves the making of mats, hats etc. Family size average is 9 children, which used to be a characteristic feature of island families.

It is noted that there is a good support for the Taunga from their spouses. When the husband is the Taunga and unable to make the medicine, the wife makes the medicine on his behalf. This arrangement also goes if the Taunga is a woman. Despite the fact the Taunga are predominantly women, the data shows that of the 67% of the Taunga who received their knowledge from the parents, 50% were trained by the father. And of the 25% who received their knowledge from the grandparents, 67% were trained by the grandfather. There is gender balance in the general population of the Taunga and it is not regarded as women's work only.

Knowledge Transfer – The average age for the Taunga is 58 years. The family size is 9 children. This is not only an indication of the level of maturity of the Taunga but, also, an indication of the vast experience they have to continue their practice to sustain the health of their family and others around them. Maturity allows for the knowledge to be passed down properly and the large family size provides the chance that the 'right' child is found to take on the knowledge. As it is listed in the analysis and discussed in the workshop, the knowledge has to take place when the 'right' person is identified.

Of the current knowledge holders 83.3% have transferred their knowledge to their children and 16.7% have transferred their knowledge to their spouse. Of the 83.3% that have transferred their knowledge to their children, 40% of the children have left the island. A problem expressed also by the Taunga is, the inability of the island economy to attract and retain its young people. However, it was also expressed that the important issue to the knowledge holder is that the knowledge has been properly transferred. It is understood that a significant portion of those children who have left the island have not gone to New Zealand and Australia but have remained on the other islands of the Cook Islands. This contributes to the pool of expertise elsewhere in the Cook Islands. It is noted also that 75% of the knowledge of those who were interviewed originated from on the island and 25% from outside of the island. This is a reflection of the way that the knowledge can be moved around. Further, the fact that no Taunga on the island use a'i for medicine may support the notion that the medicine that uses a'i may have been lost through this type of people movement.

Seriousness of the practice – Data support for the seriousness of the work of the Taunga is clear. As shown above, the maturity and commitment as illustrated by the average age and family size of the Taunga, clearly shows that transfer of knowledge following the criteria outlined at the workshop is serious business.

The re-introduction of the kava-maori from Mangaia and the poroiti from New Zealand further illustrates the strength of how determined the Taunga are to have this re-introduction take place. The Consultants heard and saw how the kava-maori is valued for a serious illness pertaining to adults and elderly people which is caused by too much hard physical work in the plantations. Although the poroiti is only used by one Taunga it has other uses that are of traditional significance to the island.

The local nurse, who supported the use of plant ingredients for healing purposes, also recognizes the seriousness of the practice. The issue of inter-island referral has a significant bearing on the seriousness placed on the traditional medicine practice, when the workshop raised the issue of how government should provide financial support to enable sick people to travel from island to island to see the Taunga.

Knowledge on plants – On average, each Taunga have extensive knowledge of at least 4 plants. The most used plant is the nu or coconut and the tiare-maori. These are the two most common plants around the homes of the Taunga. This is followed by the nono and tureimangamanga, then the vi-puaka, kava-au, tou and utu. The rest of the plants, 22 in total, including poroiti, are used by only one Taunga.

As mentioned above, the Taunga's plants, used for medicine, are usually grown around their house or else are in very accessible places.

One must also note the seriousness of the practice and to try and just retrieve access and process information from the Taunga without properly informing them of where this information is going and what is to happen to them may be out of line. One Taunga in the Mitiaro workshop vigorously said that they wanted the NBSAP document to be changed as the Maori medicine is not dying out or lost and it is not correct to give the impression that it is. This is misinforming people. Government also must not force the retrieval of their medical knowledge as they, the Taunga, are here still.

Analysis

From the data contained in this report, it is much more appropriate to build up the capacity of the Taunga so that information is properly acquired and consented to when this is needed.

It is therefore confirmed that there is a need to capacity build the Taunga so that they are better informed of what they are being subjected to by the NBSAP document.

There is an urgent need to protect their individual's rights, recognize them and undertake the appropriate capacity building measures not only to ensure consolidation of the practice of this form of medicine and the transfer of knowledge in the traditional manner but also support for measures to assist them in conserving the rare vairakau plants (in-situ and ex-situ) continues, as well as capacity building those around the Taunga who are the present or potential beneficiaries of this form of medicine.

(iii) To find ways to conserve those rare vairakau plants (in-situ and ex-situ) –

It is important to remember that the poroiti was completely lost by about 7 years ago from the island and this was caused, according to the Agriculture Officer, by the ladybird bug. Since that time the poroiti plant was not seen on the island. While there are currently new plants growing and spreading amongst homeowners, there is a need to study these plants to see how well they are holding up.

If the poroiti cannot be sustained due to continued pest attack, ex-situ conservation measures may have to be considered by identifying healthy populations on other islands and by ensuring pests like the ladybugs are not introduced to those islands. Growing the poroiti in a controlled environment may also have to be considered.

Other options provided by modern biotechnology should be looked at to find a solution to ensure the survival of this vairakau plant in-situ. However, as we do not have the facility for such an option, this is recommendation for the future.

There is also the case of the extinct grasses. The situation offered is to have the Taunga properly identify these grasses with the Agricultural Officer who can then, if the grasses are found outside of Mitiaro, discuss their re-introduction with the appropriate authorities. It is highly appropriate that this process be carried forward, if possible, by the experts from Mitiaro.

In-situ and ex-situ conservation measures for the rare plant are provided in Section 5.2.1.8.

(iv) To identify future capacity building needs required to conserve those rare vairakau plants – Although there is only one rare vairakau plant identified by the Consultants, the findings of this report has highlighted the need to protect the Taunga themselves and to encourage this age-old practice as one means to ensure that other plants do not become rare. To do this, it is apparent that the capacity building activities will take the forms of institutional strengthening (Te Vaka Taunga Society and the Education Ministry) technology to transfer knowledge (encourage the traditional transfer of knowledge system), the law (Te Vaka Taunga Society), training of people (community and Government people to understand the role of the Taunga), funds to keep the activities going and the management of information.

The capacity building activities are provided in Part C of this report

PART C - Capacity Building Needs and Analysis

7.0 National Capacity Building Needs and Analysis

7.1 Introduction

With the data collected and experience gained from the islands of Mangaia and Mitiaro, the following is a needs analysis to survey and conserve rare vairakau plants in the Cook Islands.

Capacity building needs analysis is provided under the following headings: institutional strengthening, technology to transfer knowledge, the law, training of people, funds to keep the activities going and the management of information.

7.2 Methodology

The following activities have been conducted to identify the capacity needs.

7.2.1 Defining

In this part; medicinal plants, rare plants, endangered plants, knowledge and stakeholders referred to is defined below.

The definitions are obtained through discussions held with the Project Coordinator, views of the members of the Steering Committee from two meetings during the course of the project, a review of the Natural Heritage Database together with the knowledge and experience gained from the two islands visited.

Having stated the above and mindful of the following:

- The lack of legislation to protect the Taunga and their knowledge.
- The main stakeholder (category 1) and user of vairakau plants are the Taunga and therefore their language of communication becomes priority.
- The protection of the Taunga from "professional" criticism.
- The knowledge is transferred the traditional way.

terms were defined below.

Medicinal Plants

Medicinal plants are those plants used by the Taunga vairakau. These cover any plant in the Plant Kingdom that is clearly identified by a Taunga.

Rare Plants

Rare plants are those plants that the Taunga vairakau have difficulty in finding in their usual habitat.

Endangered Plants

These are plants that are in danger of becoming rare. This may be for a number of reasons, which includes; their habitat is being threatened by a particular local activity or global activity, and, or they are being threatened by introduced pests. In view of the increased and varying land use activities including the inability of people to maintain properties from overgrowth of weeds and unchecked movement of people between islands, all vairakau plants are regarded as endangered.

Knowledge

Knowledge refers to the knowledge of the Taunga that helps to conserve and identify vairakau plants. This does not include the medicinal knowledge of the Taunga.

Intellectual Property Rights (IPR)

IPR refers to the personal property right of the Taunga over their vairakau Maori knowledge.

Stakeholders

There are two categories of stakeholders, those who use plants for the making of vairakau, referred to as category 1, and those who benefit from the vairakau, referred to as category 2.

7.2.2 Identifying Stakeholders

Category 1

- A Taunga, who has in-depth knowledge of plants for making vairakau

Category 2

- Those who have the potential to assist in the protection and management of those plants used for making vairakau.
- Those who are direct beneficiaries of those plants but specific to identified groups and persons with genuine expressed interest, i.e. they use vairakau.
- Those who do not, in their current practices, interfere or go against vairakau Maori usage.
- A list of category 2 stakeholders is listed below:
    - Supportive Traditional Leaders
    - Child Welfare Inc.
    - Supportive business people
    - Supportive Sports Organization (e.g. Soccer Association)
    - Supportive Church Groups
    - Environmental Organizations
    - Nursery and Plant development authorities
    - Supportive members of the Island Council
    - Interested teachers in the subject areas of science, social studies and Maori language
    - Supportive Health workers
    - Politicians who use and respect vairakau Maori.

It is noted that when making reference to organizations with an overall function in a specific area, such as Health, Education, Agriculture, Island Council, Traditional Leaders and the Church, for implementation purposes, this part does not cover them. This report covers only individuals and persons who have shown genuine support for vairakau Maori. It cannot state, for example, Agriculture or growers as stakeholders because agriculture promotes activities that destroy medicinal plants and growers focus on production which involves the use of herbicides etc. In the case of Health it does not support openly the use of vairakau Maori. In the same manner, some church groups do not support vairakau Maori by virtue of not recognizing the way in which knowledge is transferred and they do speak against the practice of Maori medicine. Some religious practitioners are in denial or support the practice when it suits them.

7.2.3 Structured Interviews.

Structured interviews were held with the category 1 stakeholders. The interviews covers four areas provided in section 4.2.2. It provides a description of the information to be identified for the purpose of this project.

7.2.4 Literature Review.

Vital to capacity building and the overall umbrella for conservation of biodiversity and appropriate to this NBSAP activity is the Convention on Biological Diversity or CBD. The Convention outlines the framework for the conservation and management of biological diversity. It also, specifically, provides ways to address capacity building issues. This document is reviewed in section 3.

The NBSAP document and Cook Islands Biodiversity Database was also reviewed.

Without properly assessing the status of the Taunga, the NBSAP document highlights that not only the traditional knowledge is being lost and there is an urgent need to access, retrieve and process information for public use, it also highlights above all, the obligation of the Cook Islands to do this because it signed and ratified the CBD. Although the NBSAP document covered issues such as IPR and benefit sharing, in terms of accessing traditional knowledge, IPR in particular, was just a consideration rather than part of the process of accessing, retrieving and processing of information. In the opinion of the Consultants, the IPR issue should have been a priority consideration before any other programs of the NBSAP Add-on project.

It is the finding of this report, there is a misunderstanding being perpetuated (intentionally or not) by those who prepared the NBSAP document concerning the intent of the CBD and a failure to point out that the CBD recognizes and highlights the right of the knowledge holders to their knowledge and that proper capacity building needs must be put in place so that they are fully aware of their role in the conservation of our biodiversity. The activities undertaken by the NBSAP preparatory work group, in the opinion of the consultant, blatantly did not provide adequate capacity building exercise for the Taunga who either directly or indirectly provided the needed data for the NBSAP.

7.2.5 Stability of the Taunga.

Given the background that population migration due to the changing way of life is still a feature of the island, it is important to get an idea of how stable the Taunga are at present. This issue is analysed in sections 4.2.2.1, 5.1.2.1, 5.2.2.1 and discussed in sections 6.1 and 6.2.

7.2.6 The practice.

The visiting experience from the two islands of Mangaia and Mitiaro shows that there are at least 43 practicing Taunga on these two islands alone. As with Western style doctors, Taunga have generally, a good basic knowledge of good health, and most Taunga have specific knowledge for specific illnesses. There are four main areas of expertise, children's illnesses, the women's illnesses, illnesses that are common to children and young adults and those common in adults. With this background, it can be said that on a population to doctor/Taunga ratio; there is an average of at least one Taunga to every 20 persons. In comparison to the western doctors, there is one doctor for the entire island if they are lucky.

Therefore without any support or coordinating or funding mechanism for the Taunga and also with no recognition from authorities, the fact that this medicine practice has still survived in tact and is still

thriving, must be recognised. It is useful for good health practice and also it is important for the conservation of vairakau plants and biodiversity.

7.2.7 Other people and agency consultation (Stakeholder category 2)

Some consultation took place with other individuals, both inside and outside of government. Together with those interviewed for the first part of this report and mentioned in 7.2.3, this provides a stock of current human resources levels from which to implement capacity building activities. As an indication of the sort of support and considerations raised, the relevant views of people who are not a Taunga are provided in sections 5.1.3 and 5.2.3. A list of all the people consulted is provided in Annex II which include relevant people from outside of those two islands. This stock-take also provides the foundation for the grading of the current human resources levels used in Appendix III.

7.3 Capacity Needs Analysis

7.3.1 Introduction

The analysis is provided under the six areas mentioned in section 7.1. For each of the areas the analysis have two parts, the analysis under the heading of what is happening now and the Table of activities provided in Annex III. It is to be noted that for the activities listed in Annex III effective implementation will depend on the resolution of the IPR issue.

7.3.2 Institutional mechanisms and strengthening

What is happening now?

Enabling conditions or environment to survey and conserve rare vairakau plants

The conservation of rare vairakau plants may be a function of the ES and the Ministry of Agriculture, but the responsibility goes beyond them. It is the responsibility of the people of the Cook Islands.

The Environment Act provides for the protection of biological resources, including resources such as vairakau plants that are considered worthy of special protection and management under the protected areas section. The EIA provisions provided in Section 31allow developers to consider rare plants in the risk assessment of their projects. Risk assessments are also provided for under the foreshore, wetland and slope land provisions.

The quarantine procedures under the Plants Quarantine Act of1993, which provides for the destruction of illegally imported species or species that are imported that may pose potential risks to local species in some indirect way also assists in the protection of rare vairakau plants from imported pests.

Also considered a quarantine procedure, the Animal Act of 1975 prevents the accidental introduction of pests to an island by having any ocean going vessel that must stay overnight to move out to sea to a distance of at least 5 kilometers. This prevents any unwanted pest that may be on board from reaching the island.

In the wake of the white moth that affected the coconut plants of Rarotonga, certain check out procedures of flights to the outer islands at the terminals of outer island airports provides further the commitment by the Ministry of Agriculture to address the issue of pests that may impact on local biodiversity.

To provide for the survey and conservation of rare medicinal plants, under the NBSAP document, the Environment Service (ES) is required to retrieve, access and process traditional information in order to ensure that the information required to conserve those rare plants is accessible. Currently, the ES is present only on Rarotonga (limited personnel) with Aitutaki, Atiu and Mitiaro having one officer each.

Other Government support can be provided through the Ministry of Agriculture, some OMIA activities, the Ministry of Education (MOE) (science, social studies, cultural studies and the Maori language.)[1] and the national research committee (NRC) of the Prime Minister's Office.

Of special importance in the area of surveying plants (determining of distribution and abundance) are the mechanisms and activities provided by the MOA's research facilities[2], the NRC[3], MOE senior school activities. However, there is a specific lack of focus on vairakau plant as shown by the lack of materials, and activities in this area.

The ES, EIA process used on Rarotonga, Aitutaki and Atiu is another mechanism that can be used to provide data on the state of vairakau plants including those that are rare.

Non-Government support has been indicated as strong under the Child Welfare Society, an organization established on most islands. "Supportive" groups such as listed in section 7.2.2 may provide support for future programs.

Recognition of the right of Taunga to protect and manage biodiversity

For hundreds of years without the assistance of recognized institutions, the Taunga have maintained their knowledge base on vairakau plants and thereby ensured their survival. The lack of IPR legislation that recognizes the right of the Taunga over their vairakau knowledge is an impediment to the full and proper cooperation between the Taunga and the Government Authorities. The CBD recognizes the IPR rights of traditional knowledge holders.

Under the management planning process of the NEA, it recognizes the role of traditional leaders, and through the concept of sustainable development, instigates a shared resource management agreement between resource owners and the managing authority, the NES.

Promotion of 'traditional knowledge, ownership and community participation in decision making'.

Currently, with the exception of a handful of Taunga on Rarotonga, Taunga do not belong to any institution that they can rely on to be fully informed by of the extent of what the ES have been obligated to do. The Convention on Biodiversity has been around for over ten years and only recently, the ES and other Government sectors have begun to pay attention to the implications of the Convention. The Taunga, who are the knowledge holders and database for vairakau plants, are in need of capacity building to understand the implications of the Convention and what they as stakeholders can contribute if it is in the interest of the survival of the form of medicine that they practice.

Privately driven activities of the ES in the early 90s by the late More Rua and a handful of Taunga, and later by the late Akaiti Tamarua Nui Mataiapo also only with a handful of Taunga sparked off the beginning of a capacity building exercise to bring the Taunga of the Cook Islands together and

[1] Attributed to Peter Ngatokorua and Mataora Harry
[2] Comment attributed to Anau Manarangi and William Wigmore
[3] Maria Tuoro, NRC coordinator and chairperson

to create formal recognition of the work of the Taunga, not only to keep the practice going but also to conserve the vairakau plants.

The Rarotonga based incorporated "Te Vaka Taunga – Te Rito o Te Vairakau Inc." is a result of the above work. It is an institutional option that can cater to the needs of the Taunga, both as knowledge holders and as a database of information. Verbal comments from the Solicitor General indicate that of the two options that may be considered, a new legislation to recognise the Taunga and an Incorporated society to register the Taunga under a legally recognised body, the latter option allows the Taunga to come together better to be registered Taunga vairakau. Under such an arrangement, they can make rules to regulate their practice in much the same way lawyers , doctors, or professionals are registered to practice in the Cook Islands.

This organisation was formed in the year 2000 to give those who use and make Maori medicine, the necessary recognition, to encourage the Taunga to continue to practice as well as to replant their ingredient for use. Under this incorporation, outer island Taunga can register and form their own branch of the Association and affiliate themselves with the Rarotonga branch.

As mentioned above, this project supported the formation of two affiliated branches of the Vaka Taunga i.e. Te Vaka Taunga, Te Rito O Te Vairakau Maori o Nukuroa and Te Vaka Taunga, Te Rito O Te Vairakau Maori o Mangaia. With the Te Vaka Taunga, Te Rito O Te Vairakau Maori o Rarotonga's 15 members, the Society now registers a total of 60 members from three islands of the Cook Islands.

Proposed Capacity building needs: (refer to Annex III)

7.3.3 Technology to transfer knowledge

What is happening now?

Availability of appropriate and effective technological processes

The finding of the first part of this report, is that, the traditional way of transferring knowledge from one person to another is still in tact. Refer to sections 5.1.2.2 and 5.2.2.2 for the analysis and 6.0 for the discussion. With this finding, and taking into account that this practice has already survived for at least many years, the technology should be recognized.

Although some limitations have been identified, for example, where the knowledge is not transferred due to the lack of a 'right' person to take on the knowledge, or the Taunga's unwillingness to give across their knowledge due to difficulties in practicing medicine, or a particular plant is no longer found, or an illness no longer occurs, it has still been an effective method of knowledge transfer.

As an added motivation, to recognizing and further strengthening the capacity of the Taunga, it would be better to sustain the traditional technology of transfer instead of their information being stored and managed on the Cook Islands Biodiversity database and website which will become available to any person through the internet service or published materials and CD-ROM. To retain information through the traditional way allows for a pro-active method to be practiced without depending on costly print and electronic devices that are also not accessible or useful to the work of the Taunga and most of their patients.

The Taunga do not see the transfer of their knowledge to electronic devices as any kind of priority. Other issues are seen as being of much more importance to their work e.g. referral cases.

Transfer of technology and skills relevant to the transfer of technology

A review of the way knowledge is transferred, as mentioned above, reveals that a number of constraints exist that threaten the ownership of the knowledge and the mechanism of transfer. In summary, neither the law nor current institutions support the system of transfer used by the Taunga. It does not encourage the Taunga to:

- Openly speak of their knowledge.
- Share their knowledge with others (to those that are not Taungas) without fear of loosing the mana of that knowledge.
- Identify mechanisms to share experiences (that may be useful in problem solving) with other Taunga

As mentioned in section 4.2.2.2 the transfer of knowledge is not an issue of formal education since it takes place in a home setting which makes it. To record information using modern technology will bring a foreign and impersonal aspect into the practice of Maori medicine which will be supported by a monetary dependent system that does not promote a participatory and pro-active exchange of knowledge amongst the people with the knowledge but instead promotes foreign systems of development and trade. This is conflicting with many Taunga's religious beliefs. They believe that medicine should not be sold as a product or commodity.

Up to this point, there has been no known review of the work of the Taunga with a view to recognising them and or their work.

Proposed Capacity building needs: (refer to Annex III)

7.3.4 The law

What is happening now?

Regulate or legislate appropriately current processes and activities to survey and conserve vairakau plants

On a global level, the CBD (Convention on Biological Diversity) recognizes, that, countries shall set up their own national laws to manage their biodiversity including IPR. It also recognizes the differences between countries and their ways of doing things. This principal is further engrained in the biosafety protocol to the CBD, (also called the Cartegena Convention) moves are being made to protect the biodiversity including vairakau plants from plants developed through modern biotechnological activities.

To protect vairakau plants from land use practices that alter the natural configuration of the land as well as the nature of the biodiversity, the National Environment Act provides a number of tools that can be utilized. The EIA and specific areas of concern provision, the management plan and protected areas provisions can be used for this purpose.

The Pesticide Act of 1987 could also be revised and updated to address the issue of the use of herbicides. Currently, the Pesticide Act deals only with the registration of the chemicals, so there is a need to review this Act as herbicide use does impact on the vairakau plants. This issue was discussed on the two islands visited.

Currently there is a move to develop the Biosafety Framework for the Cook Islands. An attempt to review all relevant laws that may have an effect on the movement and safe handling of living

modified organisms (LMO) or genetically modified organisms (GMO) that may affect other biodiversity in the Cook Islands including vairakau plants. This program is designed to assist with regulations the processes and activities that may be useful for conserving vairakau plants.

As for the Taunga, there is currently no law that prevents any Taunga from practicing nor are there specifically laws, recognising the practice[4] of Maori medicine.

A number of options have been discussed and these are provided in section 7.3.1.

There is scope under the up-coming Asian Development Bank Technical Assistance to the Environment Act 2003 to have the traditional knowledge on medicinal plants together with the Taunga recognised. With this TA, there is an option to be looked at to cover this area.

Proposed Capacity building needs: (refer to Annex III)

7.3.5 Training of people

What is happening now?

Appropriate Research and Training in measures for identification, survey, monitoring, conservation and the wise use of vairakau plants

This report recognizes that to continue the vairakau practice of the Taunga is vital for both the survival of their knowledge, for health care reasons, as well as the survival of their knowledge on vairakau plants.

Implementation of programs that motivate people to conserve has become an expensive exercise and this issue, in the opinion of the Consultants, is the main reason why the support for environmental protection activities has been slow. Environmental protection programs of the various Government programs, for a small population, have proven to be an expensive exercise. Environmental programs have been active since 1975. In every case, more funds have been spent on personnel to do the work rather than to activate already motivated people such as the Taunga or stakeholders to conserve resources. The introduction of new systems using foreign expertise has always been the approach. This approach was also aided by the funding agencies that are also foreign and have their own agendas.

To cater for the continuation of the vairakau practice and the maintaining of their privately acquired knowledge on plants, the Taunga must be recognized as the database. Moves to support, encourage and motivate them is possibly the best way towards applying appropriate in-situ research and training measures for identification, survey, monitoring, conserving and sustainable use of the vairakau plants.

The system of knowledge transfer by the Taunga, discussed in section 7.3.2 is a non-formal method that only takes place when conditions are right as discussed in sections 5.1.1.2 and 5.2.1.3. It is vital that the supportive groups respect this form of knowledge transfer and recognize the role of the Taunga. This is done through both the formal and non-formal training. It is also recognized that the positive promotion of the vairakau Maori is a way to make people more aware and thereby more supportive of the Taunga.

Proposed Capacity building needs: (refer to Annex III)

[4] Solicitor General, Janet Maki of the Crown Law Office.

7.3.6 Funds to keep the activities going

What is happening now?

Provide funding support for the survey and conservation of rare vairakau plants

Currently, aside from this project, there is no funding support for the survey and conservation of rare vairakau plants provided by any organization. The Cook Islands Association for Non-Governmental organizations (CIANGO) has an overall policy to support and implement activities that protect and manage our environment and resources but no specific activities in this area. Similarly, the WWF, TIS and Child Welfare Inc. support the principal of this project but no allocation of funds has taken place for financial support to conserve vairakau plants.

Although, the Te Vaka Taunga, Te Rito O Te Vairakau Maori Inc. of Rarotonga, Nukuroa and Mangaia is moving forward, its fund raising activities are limited; at this time membership fees and small donations by the members themselves is the only source of funding.

Having mentioned the above approach to activate an already motivated group, see Section 7.3.4, the Environmental Protection Fund (EPF) administered by the Tu'anga Taporoporo is the only identified internal source of funds that local groups can access to move their work forward.

Proposed Capacity building needs: (refer to Annex III)

7.3.7 Information (storage, management & dissemination)

What is happening now?

Facilitate exchange of publicly available information

Currently, public information provided on what rare vairakau plants are and how to conserve them is minimal. The Cook Islands Biodiversity database only makes mention of the plants and provides references to documents that are not easily accessed by the general public. In terms of the how to conserve those plants, the Cook Islands Biodiversity database is severely limited.

Once the IPR issue is effectively resolved, the setting up of a clearing house mechanism of biodiversity information under the add-on project and cooperation in exchange of traditional knowledge information becomes possible.

The NBSAP document, with its limited information on knowledge and habitat, is perhaps the most informed of all the documents on this issue. This has highlighted a number of issues pertaining to knowledge; such as IPR, guidelines on protected areas and surveying of endemic species.

The use by the ES of the print media, the news papers, with their spot advertisement is another way to facilitate the exchange of information.

Appropriate public education and awareness activities

Public education in the area of vairakau plants is non-existent. From the experience of Mangaia and Mitiaro, beautification programs and the activity of growers is an indication of the lack of public education in this area. The Mitiaro Ministry of agriculture officer strongly urged that the Taunga conduct an awareness type of program whereby they show the beautification people which plants

are important so that ways to keep the program going without destroying those plants can be found and implemented.

Media is not used for this purpose due to the lack of funding and the lack of appropriately prepared information for this option.

Promote Notification, exchange of information

The establishment of the Vaka Taunga on each of the inhabited islands of the Cook Islands and the effective resolution of the IPR issue will allow the Taunga of each island to assess information required for public exchange especially where conservation of rare plants are concerned.

Maintain and organize by any mechanism any data on vairakau plants

The current set of information maintained by the Cook Islands Biodiversity Database is severely in need of review to give local people more usage. Currently, the information is designed for the use of the English speaking part of the population and not available to most of the knowledge holders especially those who do not have computers and/or live in the outer islands of the Cook Islands.

Proposed Capacity building needs: (refer to Annex III)

7.4 Priority Capacity Building Needs

Priority capacity building needs were identified from the capacity building activity provided in each of the six areas of the capacity needs analysis. Priority was determined according to the following criteria

- The lack of IPR legislation and recognition of constitutional rights of the Taunga in regards to their knowledge which is their personal property.
- Practical, meaningful ways to move forward to promote, encourage and implement conservation measures required for managing the rare vairakau plants identified.
- Appropriate in-situ and ex-situ conservation measures required for managing rare vairakau plants.
- Appropriate knowledge to be used to conserve rare vairakau plants.
- The use of the language of the Taunga is priority.

There are five priority capacity needs identified for implementation. Please note, activities 2 and 3 have been partially completed. Activity 2 is waiting for translation of material. For Activity 3, Annex IV gives details for the implementation of the first phase. This activity requires more visits to continue to share the information listed.

The activities are listed and described below:

Activity 1: IPR legislation and recognition of the rights of the Taunga over their vairakau Maori knowledge.

a. Meet with the Taunga vairakau Maori on each island and explain to them, the purpose of having to effectively deal with law for the protection of their knowledge, as well as how to do so.

b. The process of meeting the Taunga as in a. must not be one off matter but instead a series of visits must be instigated to ensure that the Taunga are clear, not only about what is requested of

them, but also how policy and law can cater to their interests and allow them to practice their medicine freely.

c. The Meetings referred to in a. and b. must be conducted in the language of the Taunga and by a person who respects the work of the Taunga.

Activity 2: Bring together the Taunga

(Status: Implemented a. as part of TOR, see Annex IV)

a. Discuss and confirm a mechanism to bring the Taunga together.

b. Share views on the following:
   I. IPR legislation and recognition of the rights of the Taunga over their vairakau Maori knowledge.
   II. Information on in-situ and ex-situ conservation of vairakau plants,
   III. Issues that affect the conservation of rare vairakau plants
   IV. The effect of Convention of Biodiversity derived activities on local issues i.e. NBSAP
   V. What has been done on Rarotonga.

Activity 3: Information package on the issues of rare vairakau plants and the vairakau practitioners (Taunga) who use them.

(Status: Implemented a. as part of TOR, see Annex V)

a. Using an appropriate method (Newsletter) prepare information to highlight the issues of rare vairakau plants and the problems faced by the Taunga vairakau.

b. The package is to be used to be used as public information for capacity building purpose.

c. The package is to be translated into the language of the Taunga and released for public information and also to be used by schools.

Activity 4: Coordinate the activities of the Taunga including in-situ and ex-situ conservation measures

a. Working together with the Agriculture Officer (and Officers of the Tu'anga Taporoporo if the island has any) of each island to identify the rare vairakau plants, and inform the public of the identity of the plant.

b. Prepare a plan of action on how to conserve those plants.

c. Working together with the Agriculture Officer (and Officers of the Tu'anga Taporoporo if the island has any) who monitors the progress of the conservation program by observing any changes in the targeted vairakau plant abundance and distribution. If the in-situ conservation measure does not work, the Agriculture officer can discuss with the Ministry of Agriculture as well as the Tu'anga Taporoporo any possible alternative measures including ex-situ methods.

Activity 5: Coordinate the activities of the Taunga with the view to sustain the practice and maintain its recognition and continue activities to conserve vairakau plants.

a. Identify funding sources, including EPF funding to support a coordinating body outside of Government to coordinate and maintain the activities of the Taunga.

b. Provide support to MOE, USP, MOC, NES, NHP, MOA and environmental NGOs and the public information systems (media) for preparing of appropriate material for their use and also for the use of the Taunga.

PART D - Recommendations

It is recommended that priority consideration be given to the IPR issue in order to facilitate the smooth implementation of the rest of these recommendations below.

Survey of rare vairakau plants – it is recommended that:

1. The Taunga together with the Agriculture Officers (and Tu'anga Taporoporo Officers, if they have any) identify other vairakau plants that are hard to find and find ways to conserve them (in-situ first, and if the efforts are not successful, ex-situ measures must be found and implemented.

2. The rare plant poroiti, must be surveyed using the "by looking method" to monitor the progress of the in-situ conservation program discussed in this report.

Conservation measures for rare vairakau plants – it is recommended that:

1. The Taunga together with the Agriculture Officers (and Tu'anga Taporoporo Officers, if they have any) follow the in-situ conservation measures provided for the poroiti and that program is to be monitored by the Agriculture Officer.

2. In the case that the in-situ conservation measures for poroiti prove unsuccessful for reasons outlined in this report, ex-situ measures provided should be looked at.

3. In the case of other islands where rare vairakau plants are not identified, the identification must be carried out by the Taunga and the officers mentioned above and the appropriate in-situ and ex-situ measures identified for implementation.

Knowledge of rare vairakau plants – It is recommended that:

1. NBSAP project to recognize the ownership and individuals rights of a Taunga to hold and share the knowledge that he/she has.

2. NBSAP project to recognize that the language of the Taunga is priority and should be the frontline language of communication.

3. Since the knowledge holders, the Taunga, are still in tact and not becoming rare or extinct, it is not proper to remove their knowledge without properly informing them and respecting their wishes in regards to their knowledge as well as their time. The present capacity of the Taunga to realize the full implication the NBSAP document was disregarded.

4. The knowledge of the Taunga on their medicine and how it links with the vairakau plants should not be obtained until the intellectual property right legislation is enacted and their rights to their knowledge protected. Unethical behavior such as bullying them out of their medicine information is not to be tolerated.

5. The NBSAP Add-on project to prepare appropriate information in the language of the Taunga on the following to assist in properly informing the Taunga of the Taunga:

   a. CBD and other relevant international laws and our obligations and their impact on the role of the Taunga as knowledge holders
   b. National laws that support these international laws
   c. IPR issues, proposals etc.

d. Benefit sharing, the process, and who is involved and who benefits and how to benefit
e. Other issues that affect the Taunga as knowledge holders that contribute to the conservation of our biodiversity.

Capacity building need and activity – It is recommended that:

1. NBSAP Add-on project implement the remainder of the priority capacity building needs listed in section 7.4

2. After the IPR issue is effectively resolved the NBSAP Add on project use the Information provided in Annex III for the development and implementation of future programs on capacity building activities.

3. NBSAP Add-on project assist, financially, the programs of the three Te Vaka Taunga, Te Rito O Te Vairakau Maori Association of Rarotonga, Nukuroa and Mangaia and others that may follow suit.

Other documents reviewed

National Capacity-Self Assessment project document for the Cook Islands, 2003
Island Environment Management Plan – Auau Enua, 1998
Plant Quarantine Regulations 1993
Domestic Plant Quarantine Regulations 1993
Pesticide Act 1987
Animal Act 1975

Annexes

Annex I

Terms Of Reference (TOR) – Attachment A (1) to the Consultancy Agreement

The Consultant will work under the direction of the Project Coordinator of the Environment Service, Government of the Cook Islands. The consultant is encouraged to utilize the NBSAP add-on Project Document throughout the undertaking of this consultancy. This will be available from the Environment Service Office.

Consultant Tasks

1. To develop a program to implement the actions in the NBSAP Strategic Goal A (c).
2. Initiate the program to develop and evaluate the capacity and assess future needs.
3. Carry out the implementation activities/program by having personnel's or organization groups who can assist with the program to build their capacity on Biodiversity related issues. (Note: Additional personnel will come from the consultant fees)
4. Have a comprehensive report viewing and analyzing the state of capacity and implementation of the project.
5. Identify appropriate national measures to promote in-situ and ex-situ conservation.
6. Identify and assess best practices and mitigation measures to address threats to biodiversity.
7. Identify capacity building measures to ensure the preservation and maintenance of biodiversity related traditional knowledge, practices and innovation.
8. Take stock of existing human and institutional capacity as well as legal, policy and financial mechanisms and prepare detailed recommendation for on-going capacity building.

Schedule of Reports

The consultant will be required to present a written report on the following by and not after the dates specified:

- A progressive report on implementation of the project and further needs
- An Assessment Report on existing and required capacity and development program
- An overall report on the full implementation of this consultancy including the analysis of the state of capacity and future needs.

Time Schedule for Reports

	Tasks	Due date
1	Progress on Implementation Report	Wednesday 31st March 2004
2	Capacity Needs Assessment Report	Friday 14th May 2003
3	Final Report	Friday 25th June 2004

Annex II

List of people interviewed

Mangaia

Government people

Tuaine Tuara
Mataora Harry
Nuku Raumea
Taata Tangatakino
Unlucky Tungata

Non-Government people

Mataora Harry (for the Aronga Mana)
Tuakeu Daniel
Noora Ngametua
Ngatokorua Tanagitamaiti
Tangimama Raeputa
Takau Daniel
Rongo Tumarama
Teaio Metuavaine Karena
Roiroi Makikiriti
Pakati Taokia
Tearoa Nooroa
Keni Rennie
Panitu Tuara
Paina Kareroa
Annie Moeauri
Tangitamaiti Atariki
Arumetua Pukeiti
Tutu Ngariu
Moeroa Teuira
Moetaekore Maine
Tere Harry
Allan Tuara

Mitiaro

Government people

Teokotai Topa
Nooroa Pouao
Tokai Ngaiorai

Non-Government people

Tou Ariki
Porima Henry
Temou Raeputa
Turangatira Turangatira
Mata Kopa
Moumou Ngametua
Tua Taae
Temaeuoterangi Ariki
Nootai Nootai
Tairi Putiare
Tairiau Matearíki
Maara Kimiora
Pariu Teuira
Vaine Toa

Others

William Wigmore
Gerald MaCormack
Terangi Little
Vai Henry
Janet Maki
Maria Tuoro
Ngatuaine Maui
Anau Manarangi
Ngatoko Ta Ngatoko

Annex III

National Capacity Building Needs

It is to be noted that for the activities listed in the table below effective implementation will depend on the resolution of the IPR issue.

Needs area:	Issues:	Mechanisms involved and who is responsible:	Appropriate role:	Current human resources level:	Capacity building needs activity required:
1.0 Institutional mechanism and strengthening	1.1 Enabling conditions or environment to ensure the survey and conservation of rare vairakau plants is carried out.	1.1.1 NES - EIA process, Management Plan process and the making of regulations.	Determines the state of rare vairakau plants in an area (survey it, monitor it and conserve it)	Not good	1. Proper on-job training of current personnel at ES, 2. Recruit trained personnel, 3. Development of materials for awareness raising activities,. 4. Awareness raising activities providing information on how to identify and conserve rare vairakau plants, 5. Make known to consulting firms and the general public the guidelines and policies above.
		1.1.2 NES - Management Plan, EIA and specific areas of concern, approval process	In-situ and ex-situ conservation measures and monitoring	Not good	1. Formulate guidelines to conserve (in-situ and ex-situ) vairakau plants, 2. Formulate Government Policy for research purposes 3. Make known to consulting firms and the general public the guidelines and policies above.
		1.1.3 NRC - Approval of Research application, MOA - research services through it officers.	Determines the state of rare vairakau plants in an area (survey it, monitor it and conserve. it)	Not good	1. Develop and approve research application guidelines 2. Develop and implement research guidelines 3. Make known to researchers the guidelines above.
		1.1.4 CLO – Laws	Institutional set up and legal review of relevant laws	Not good	1. Recruit more lawyers at Crown Law 2. Recruit lawyers who are proficient in the language of the Taunga. 3. Prepare and implement programs to advance the understanding of knowledge holders on what is required of them and why.
	1.2 Recognize the knowledge of Taunga to protect and manage rare	1.2.1 Vaka Taunga - Coordinate the activities of the Taunga and dissemination to them of	Know who the Taunga are and have them, survey, monitor and conserve	Very good	1. Create awareness to cause more Taunga to register. 2. Bring the Taunga together to work with others that share the same interest.

	vairakau plants	information			
		1.2.2 NHP and ES - Research	Keeper of modern technology database, information and information update	Not good	1. Recruit trained personnel with fluency in the language of the Taunga to manage the database. This will make the information more accessible to those who will protect and conserve the plants.; 2. Ensure that issues on the rights to the information are fully understood by the NHP, ES and especially the Taunga.
	1.3 Promoting the importance of 'traditional knowledge, its ownership and the role it plays in community decision making'.	1.3.1 Vaka Taunga - Coordination of the activities of the Taunga and dissemination to them of information	Keeper of traditional knowledge and preservation of knowledge in the traditional way	Good	1. Promote activities that recognise the practice of Maori medicine. 2. Assist sustainable development activities that sustain the economies of the islands to ensure the Taunga do not leave their respective islands. 3. Review Government policy with a view to address the real social issues that are causing our people to leave.
		1.3.2 MOE and USP Extension Services – Formal Training	Delivery of school curriculum and USP courses with emphasis on 'traditional knowledge, its ownership and the role it plays in community decision making'.	Good	1. Material development for formal education purposes 2. Ensure research reference materials are available locally 3. Appropriate Training for teachers who play lip-service to the use of vairakau plants for medicine, 4. Material development for training of teachers (audio, visual, CD-ROM) in the language of the Taunga..
		1.3.3 Media - Coordination and delivery of public information.	Information provider, knowledge transfer and facilitator of desired activities	Very good	1. Development of appropriate materials to be used by the media. 2. Instigate practical but relevant activities to promote the work of the Taunga that the media can use.
2.0 System to transfer knowledge	2.1 Availability of appropriate system to transfer knowledge	2.1.1 Taunga - Traditional system of transferring knowledge	Ensure the survival of the practice and knowledge on plants	Very good	1. Recognise the practice of Maori medicine. 2. Active support by supportive groups (category 2 stakeholders) by word of mouth.
	2.2 Transfer of technology	2.2.1 – MOE and USP Extension Service, provide formal education training	In-situ and ex-situ conservation of rare vairakau plants. Appreciation of plants	Good	1. Together with the Taunga, develop materials as teaching aids, 2. Survey and monitor vairakau plants as school or course projects
		2.2.2 Media, ES, MOC, MOA – using modern	Information provider on rare vairakau plants	Not good	1. Together with the Taunga develop appropriate material for publication and dissemination.

		technology for recording – print and electronic			2. Develop and provide pro-active participatory training programs
		2.2.3 NRC, ES, MOA, MOC - Research – search and learn	Information provider for knowledge and appreciation.	Not good	1. Formulate and approve research guidelines to be followed by researchers. 2. Make available, in an appropriate form, research documents prepared by researchers. 3. Promote research work in the language of the Taunga.
3.0 The Law	3.1 Regulate or legislate appropriately current processes and activities to survey and conserve vairakau plants	3.1.1 MOJ, MOC, MOA, ES, NRC - Intellectual property rights (IPR) – consult and seek the support of Taunga.	Preservation of the rights of Taunga to their knowledge.	Not good	1. Consult with the Taunga and seek their support on IPR by informing them of the pros and cons of any proposed IPR policy or proposed legislation. 2. Any consultation (verbal, written, audio and visual material produced) must be in the language of the Taunga. 3. Material development in the language of the Taunga on IPR
		3.1.2 ES - Management Planning process – protected areas development for the in-situ and ex-situ conservation of rare vairakau plants.	Conservation of rare vairakau plants.	Not good	1. Provide to private consulting persons a list of all the endangered and rare vairakau plants and guidelines to conserve them (in-situ and ex-situ) 2. Consulting persons to undertake public, and specific interest group consultations when writing up management plans and preparing shared resource management agreements.
4.0 Training of people	4.1 Appropriate systems to train people to support measures for identification, survey, monitor, conserve and the wise use of vairakau plants	4.1.1 Taunga - Traditional system of transferring knowledge	Ensure the survival of the practice and knowledge on plants	Very good	1. Recognise the practice and the knowledge that it carries, 2. Active support by supportive groups (category 2 stakeholders)
		4.1.2 – MOE and USP Extension Service, formal education training	Support at foundation level	Good	1. Development of appropriate curriculum material (As in 1.3.2) 2. Development of appropriate teaching material (print, electronic (audio, visual, CD_ROM)) in the language of the Taunga. (as in 1.3.2)
		4.1.3 ES and MOA officers assisted by the Taunga Vocational	Conservation of rare vairakau plants	Not good	1. Together with the Taunga identify plants that are endangered and rare. 2. Together with the Taunga identify and implement in-situ

		training – on-job training of staff			and ex-situ conservation measures for the preservation of the plants. 3. Together with the Taunga develop and implement survey and monitoring methods.
		4.1.4 Supportive traditional leaders, politicians, members of the island Council	Leadership support	Good	1. Offer the choice to the people to realise there is an alternate to the western medicine. 2. Recognise the practice of the Taunga by not speaking against it or those who are using it. 3. Recognise the practice of the Taunga by informing the public that they have the right to practice. 4. Do not pay lip service to the practice and the Taunga.
		4.1.5 Child Welfare Inc.	User of medicine and plants and dissemination of information.	Good	1. Strengthen the role of the Association and provide assistance in the form of information (on the field) from the Taunga and realisation of the effectiveness of the practice. 2. Taunga groups through their regular meetings to invite mothers to attend discussions or arrange for personalized sessions.
		4.1.6 Supportive business people	Assess and consider importation of harmful products.	Good	1. Make an input into the reviewing of trade laws including those laws that deal with the trade of harmful substances and their disposal or, their by-products. 2. Make available to supportive business people appropriate information on the conservation of vairakau plants and involve them in the field activities.
		4.1.7 Supportive Sports Organisation	User and dissemination of information.	Good	1. Encourage the use of local medicine, those that are useful in the treatment of injuries and the plants used for that purpose. 2. Make available to supportive Sports Organizations appropriate information on the conservation of vairakau plants. Involve them in conservation programss
		4.1.8 Supportive Church Groups	Eliminate competition with regards to religious jurisdiction and tolerance.	Good	1. Offer the choice to the people to realise that the belief of the Taunga is real. 2. Recognise the practice of the Taunga by not speaking against it for those who are using it. 3. Recognise the practice of the Taunga by informing the public that they have the right to practice. 4. Do not pay lip service to the practice and the Taunga. 5. Promote the belief that healing is not the work of the devil

					but the work of god – the Taunga heals.
		4.1.9 Environmental NGOs	Dissemination of information.	Good	1. Through the activities of the NGOs in promoting their conservation of our resources policy, highlight the work of the Taunga. 2. Assist the Taunga in the preparation of appropriate information for dissemination to the public. 3. Consult extensively with the Taunga when preparing any information for dissemination. 4. Act as a watch-dog and support group for the Taunga.
		4.1.10 Nursery and plant protection authorities	Nursery development, research and quarantine services to protect vairakau plants.	Good	1. Strengthen and continue outer island port-check points to prevent accidental introduction of unwanted pests. 2. Together with the Taunga, identify rare and endangered vairakau plants, and reproduce by the appropriate means, for transplanting to increase their numbers. 3. Together with the Taunga, study by observing, plants that are seasonal and protect using appropriate and local measures, the areas involved (in-situ conservation).
5.0 Funds to keep the activities going	5.1 Provide funding source and mechanism to allow for the conservation of rare vairakau plants	5.1.1 EPF fund – approval process follows set guidelines	Sustain conservation activities	Good	1. Prepare packaged information on the fund, what it is, how to apply and what are the criteria required. 2. Make organizations know of the fund and its merits 3. Set up a mechanism for transparent application.
		5.1.2 Membership fees – Vaka Taunga	Sustain conservation and management activities	Good	1. Promote the role of the Vaka Taunga amongst the Taunga. 2. Encourage more Taunga to join.
		5.1.3 Donations – Public and members	Sustain conservation and management activities	Good	1. Promote the role of the Vaka Taunga amongst the Taunga. 2. Recognise the practice and promote it as an alternate form of medicine.
		5.1.4 ES - Benefit sharing	Sustain conservation and management activities	Not good	1. The Environment Service to prepare, in the language of the Taunga, an information package on benefit sharing so that, if the need arise this could be used to assist the Taunga in the implementation of conservation measures to conserve rare vairakau plants. 2. The Environment Service to involve at all times the Taunga in their working process on this issue.
6.0 Management of	6.1 Facilitate exchange of publicly	6.1.1 Media centres, ES, MOA, MOC, Gov-media,	Storage, management and dissemination of	Not good	1. Provide for the public, appropriate information, required to conserve endangered and rare vairakau plants.

Information	available information	library service - Print medium.	data		2. Set up library and information service centres in the outer islands to allow for the storage and access of information on those islands.
	6.2 Appropriate public education and awareness activities	6.2.1 Media centres, ES, MOA, MOC, NHT, Gov-media, library - Electronic medium	Storage, management and dissemination of data	Not good	1. Provide for the public, appropriate information, required to conserve endangered and rare vairakau plants. 2. Set up library and information service centres in the outer islands to allow for the storage and access of information on those islands. 3. Provide public internet services in the outer islands where website information can be easily accessed.
	6.3 Maintain and organize by any mechanism any data on vairakau plants.	6.3.1 ES, MOA, MOC, NHT, Private and NGOs	Storage, management and dissemination of data	Not good	1. Set up a credible and responsible committee to oversee the operations and information management system of a credible and responsible organization. The organization to have properly set up protocols to be followed when updating an approved information data. 2. Update regularly any information base on rare and endangered vairakau plants.

Current human resources level (refers to number of people in that area) Not good = below required level, Good = enough to do the work, Very good = good number to do the work well

Annex IV

Activity 2: Bring together the Taunga

Priority Capacity Building Activity Report - Mitiaro

Te Vaka Taunga, Te Rito O Te Vairakau Maori Inc.

1. Te Vaka Taunga, Te Rito O Te Vairakau Maori O Nukuroa

During the month of June, the 10th day, the year 2004 a workshop was held on the island of Nukuroa on vairakau Maori.

The workshop was attended by the following people:

2. Kimiora Turangatira
3. Akereu Tuavai
4. Vainepoto Toa
5. Toru. V. Putiare
6. Eugene Tou
7. Makiuti Tou
8. Moumou Ngametua
9. Tuavai Taae
10. Mata Nootai
11. Temou Tangatapoto
12. Matatai Taia
13. Turua Tunoa
14. Teei Aupuni
15. Temaeu Teikamata Ariki
16. Nooroa Teariki F. Tereva
17. Ngametua Kimiora
18. Raeputa Tunoa
19. Matatu Ngatuakana
20. Pokongaa Ngaiorae
21. Noopoti Tangaroa
22. Vaine Porima
23. Pareu Teuira
24. Poko Aurupa
25. Porima Henry
26. Turangatira Turangatira
27. Nootai Tangapiri
28. Tunoa Kaukura
29. Reverend Rusmussen
30. Tetiare Taia
31. Joseph Hermann
32. Tokai Ngaiorae
33. Julian Aupuni
34. Kimiora Pouao
35. Nooroa Pouao
36. Aretiare Tokai

In that workshop, the people present agreed for Nukuroa to become part of the Te Vaka Taunga, Te Rito O Te Vairakau Maori Association according to the rules of that Association.
Also, at the workshop, the people present agreed that some changes have to be made to the Constitution of the Association as required under Rule 12. Here are the changes to be made.

1. The name for the position of Manager on the Management Group to be changed to Chairperson
2. That an assistant be elected for each of the positions on the Management Group
3. That all the Taunga to be registered to be a Committee Member

The people at the workshop elected the members to their Management Group. The members are:

Chairperson	Mr. Tuavai Taae
Assistant Chairperson	Mrs. Matatai Taia
Secretary	Ms. Matatu Ngatuakana
Assistant Secretary	Mrs. Aretiare Tokai
Treasurer	Mrs. Vaine Porima
Assistant Secretary	Mrs. Eugene Tou

The workshop confirmed that the most important purpose of the Association is to be able to protect the practice of vairakau Maori making of Nukuroa. In the protecting of the practice, this will involve the use of different measures to conserve plants and the knowledge of the Taunga under Maori custom.

This purpose was strongly supported by the representatives of the Tu'anga Taporoporo and the Ministry of Agriculture.

This purpose and the setting up of the Association on Nukuroa was also strongly supported by the Ui-Ariki and Aronga Mana of the island.

2. The registered members of the Te Vaka Taunga, Te Rito O Te Vairakau Maori O Nukuroa are:

1. Porima Henry
2. Pokongaa Ngaiorae
3. Poko Aurupa
4. Raeputa Tunoa
5. Tuavai Taae
6. Tunoa Kaukura
7. Pareu Teuira
8. Moumou Ngametua
9. Vainepoto Toa
10. Toru Putiare
11. Maara Kimiora
12. Nootai Tangapiri
13. Temou Raeputa

14. Tairi Putiare
15. Kimiora Turangatira
16. Turangatira Turangatira
17. Noopoti Roea
18. Tairiau Teupe Matearíki
19. Vaine Porima
20. Mata Nootai
21. Maemo Taia
22. Nootu Topa
23. Maara Tokai

3. The Management Group met after the workshop to prepare details of their account to be opened at the Bank of the Cook Islands (BCI)

Priority Capacity Building Activity Report - Mangaia

Te Vaka Taunga, Te Rito O Te Vairakau Maori Inc.

1. Te Vaka Taunga, Te Rito O Te Vairakau Maori O Mangaia

During the month of June, the 22nd day, the year 2004 a workshop was held on the island of Mangaia at the village of Ivirua on vairakau Maori.

In that workshop, the people present agreed for Mangaia to become part of the Te Vaka Taunga, Te Rito O Te Vairakau Maori Association according to the rules of that Association.

At the workshop, the people present agreed that some changes have to be made to the Constitution of the Association as required under Rule 12. Here are the changes to be made.

1. The name for the position of Manager on the Management Group to be changed to Chairperson
2. That an assistant be elected for each of the positions on the Management Group
3. Three members each from each of the villages (Oneroa, Ivirua and Tamarua) as Committee Members as required under Rule 8 A(4).

The workshop also agreed that the Taunga that did not attend the meeting for reasons of transport be visited by the Consultant to seek their view and to take up the assistant positions on the Management Group as amended above.

The people at the workshop elected the members to their Management Group. The members are:

Chairperson		Keni Maki
Secretary		Arumetua Ngatae
Treasurer		Tearoa Nooroa
Committee Members	(Oneroa)	Tere Mataora Harry
		Takau Daniel
	(Ivirua)	Pakati Taokia
		Moetaekore Maine
		Teaio Karena
	(Tamarua)	Rongo Tumarama
		Tangimama Amataiti

The workshop was attended by the following people:

1. Roiroi A.
2. Mataora Harry
3. Kimi Marurai
4. Moe Luere
5. Tupopongi Paia

6. Piri Amataiti
7. Pakati Taokia
8. Moetaekore Maine
9. Tearoa Nooroa
10. Keni Maki
11. Arumetua Ngate
12. Marion Orake
13. Makitua Taata
14. Metuaivi Ruua
15. Vai Maora

Apologies:

Tere Harry
Takau Daniel
Metua Mautarii
T. Tutu
Rongo Tumarama
Tangi Atariki
Tangimama Amataiti

2. The registered members of the Te Vaka Taunga, Te Rito O Te Vairakau Maori O Mangaia are:

1. Moeroa Teuira
2. Arumetua Pukeiti
3. Keni Maki
4. Moetaekore Maine
5. Tuavai Taae
6. Noora Ngametua
7. Pakati Taokia
8. Roiroi Makikiriti
9. Tangimama Raeputa
10. Annie Moeauri
11. Tutu Ngariu
12. Tuaine Ngarangi
13. Teremoana Teretutu
14. Tearoa Nooroa
15. Teiao Metuavaine Karena
16. Tanitu Tuara
17. Tangitamaiti Atariki
18. Takau Daniel
19. Rongo Tumarama
20. Apai Kareroa

3. The Management Group met after the workshop to prepare details of their account to be opened at the Bank of the Cook Islands (BCI)

Annex V

Activity 3: Information package on the issues of rare vairakau plants and the vairakau practitioners (Taunga) who use them.