

European Union and SOPAC

**Programme for Water Governance
Fiji Water Resources Management
at National Level**

Final Report: Summary

Water Policy
Services Pty Ltd,

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Chapter 1. Summary and Recommendations

1.1 Introduction and scope of pilot

The European Union funded Fiji pilot for the Programme for Water Governance (PfWG) has been intended to progress water resources management at the national level in Fiji. In doing so, it was understood that there are several important elements for introducing an IWRM approach and establishing the requirements for water resources management to handle emerging and future challenges posed by the progressive impact of development on water, the likely increase in demand for water and potential population increase, and the pressures on water quality.

The pilot involved the assistance of an international water resources consultant with a total input of three months between August 2005 and August 2006. A local consultant report on water resources information involved one half month input. The Government of Fiji provided accommodation and facilities for the pilot.

While environmental management is responsible for some aspects of water resources regulation, in particular monitoring, pollution control through discharge permits, there are other important aspects of water resources which are not covered as they should be, in particular water allocation.

The pilot identified the following elements in its analysis of water resources management requirements:

- Policy on water resources
- Legislation for water resources management
- National coordination for water resources
- Institutional development
- Planning mechanisms
- Water resources information
- Technical capacity
- Education and awareness.

Recommendations are made in each of these areas. National coordination is included in the chapter on institutional development.

This outline does not include consultation and participation as a distinct element, but the intention has been to build them into the other elements.+

1.2 Definition and scope of water resources management

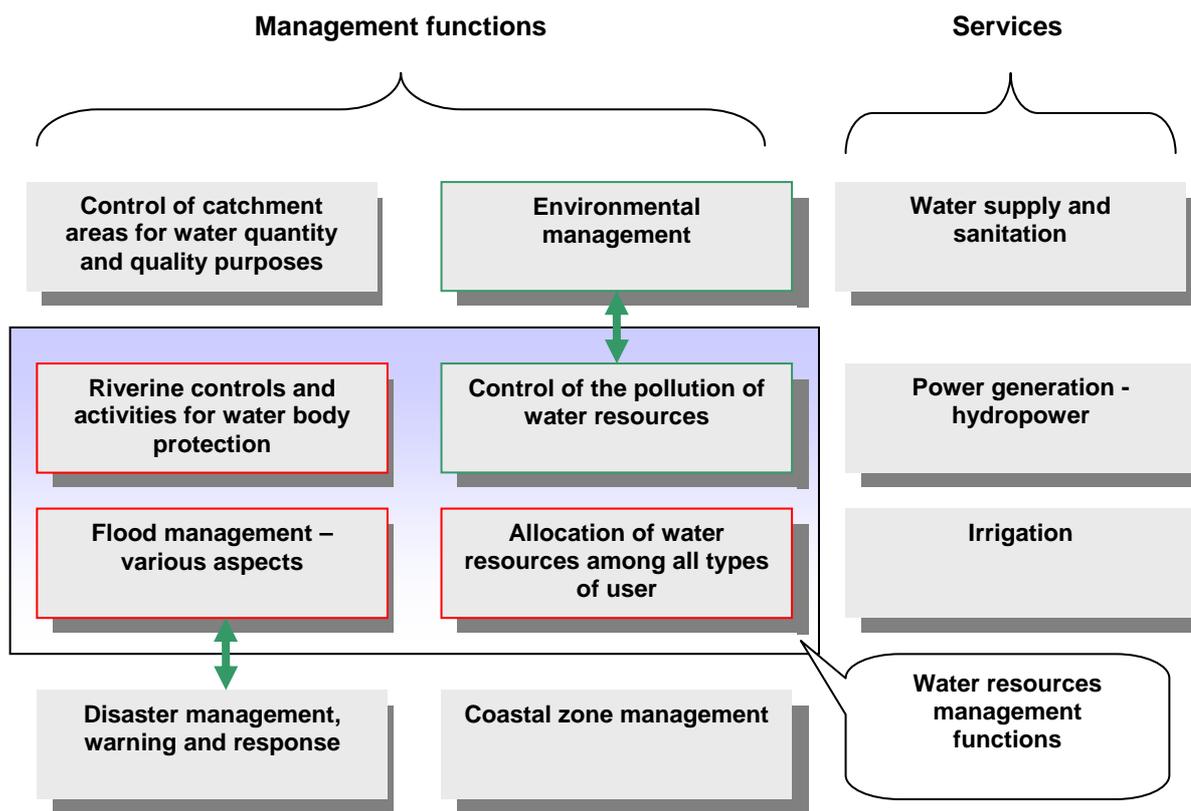
The focus of the pilot is on 'water governance' which aims to establish or strengthen the function of government known as water resources management. Problems in the water sector are now recognised to be closely related to governance, which includes organisation, policy aspects of cultural practice. It is also widely understood that water services and water management are different types of government responsibility. The first involves providing services such as water supply and sanitation to the public as

consumers, and it therefore amenable to commercial models which focus on customer service. This is the philosophy behind the commercialisation of the Public Works Department (PWD) water supply and sanitation responsibilities.

Water resources management, however, is a core function of the government, similar in nature to the management of other natural resources such as forests and minerals. Water resources management is defined as the active management of freshwater resources, whereby the government ensures that they are being exploited productively, fairly and sustainably and at the same time protected. The protective aspect is important for water resources in ways that do not apply to minerals, for example, as water is susceptible to pollution and is a renewable resource which must be sustained permanently.

Water resources management in the broadest sense includes a number of responsibilities which are being undertaken in Fiji today, as shown in Figure 1, which shows four 'core' aspects of water resources management, along with other related management functions and the most common water-related services and water use functions.

Figure 1: Water management and related functions of government



Pollution control is most frequently undertaken as part of environmental management, although it can also be categorised as part of water management. In Fiji, the control of water pollution is the responsibility of the Ministry of Environment and should remain so. However, it has a close connection with the allocation of water resources. The three remaining areas, shown in Figure 1 as water management functions, are those which this report most actively deals with, namely water allocation,

riverine controls and flood management, not including disaster response which is already covered by the National Disaster Management Office (NDMO).

The pilot programme aimed to identify what is currently being done and what needs to be done in the future in order to develop the water management capability that Fiji requires. The following recommendations are made in the key areas covered by the pilot..

1.3 Water resources policy

During the course of the pilot, Cabinet approved an interim National Water Policy draft, subject to consultation. The policy document received assistance from the PFWG pilot in the form of advice and drafting suggestions. The document viewed by Cabinet is interim because it was developed prior to consultation but also because it needs to be further developed in important areas.

The current policy states the key principles for water resources management in Fiji and commits the Government to further advances in (i) a national water council, (ii) water resources legislation, and (iii) water resources information.

Further work on policy has been completed through the pilot, comprising:

- Detailed policy proposal for small settlement water supply installation and management;
- Identification of other policy areas that require development.

1.3.1 Policy on provision of local water supplies

A policy proposal has been developed by the pilot on the provision of local rural water supply schemes. These may take supply from rivers, streams or groundwater. They do not normally include a rainwater harvesting component. The policy is intended to bring a comprehensive approach to the design and management of water supply at the local level. The policy also addresses the problem of pollution of water sources and the local management of water supply schemes.

The key instrument the policy would introduce is a water supply management plan (WSMP) which must be signed by those representing the communities being supplied and by the relevant government agency. The plan states the responsibilities of the local community and identifies the people whose task it is to oversee the scheme, to operate it and maintain it. The plan establishes a set of obligations on the part of both the government and the village community, which would be relevant to any future request for assistance. In this way, it is hoped, the community will see the scheme as their own and not merely as something the government built for them.

The draft policy proposal is included in Chapter 3.

Recommendation:

- That the national water committee consider the draft policy proposal and take steps to have a policy adopted by Cabined, amended if appropriate, following consultation.

1.3.2 Flood management and floodplain development

Policy needs to be developed on the approach to flood control and management in Fiji. Currently, various flood control projects are undertaken, mainly by the Land and Water Resources Management

(LWRM) division of the Ministry of Agriculture, but these have been developed so far without a policy framework that links activities and works in upper, floodplain and estuarine areas.

The fastest development in Fiji is in coastal areas and associated floodplains, where consideration of potential flooding needs to be more actively considered. If flooding is not considered, coastal development will increasingly form barriers to flood flow adjacent to and behind the coast, with resulting disruption and property damage. Matters on which policy decisions need to be made are:

- How flood risk is assessed and what level of flood risk should be considered acceptable;
- What measures need to be taken to minimise flood risk, including the role of dams in reducing flood peaks;
- How regional development plans should be used to the planning (so that measures can be taken accordingly, including limits on development);
- Whether flood maps should be produced to identify likely flood frequency and guide development
- What flood-related measures and criteria should apply to road construction.

Recommendation:

- That a flood management policy be developed to encompass the flooding issues in upper catchments, flood plains and estuaries, with the objective of linking development in all areas and establishing appropriate flood plain plans and controls.

The specifics of planning and control measures are given in Chapter 8.

1.3.3 Water allocation

Water allocation – the development of groundwater– Is the issue that has drawn the attention of the Government to water resources management in Fiji. In order to establish a working water allocation scheme, a number of important policy decisions must be made. They include:

- Whether some water uses, such as town water supply, should have priority over other uses at times of water scarcity;
- How the interests of native land holders should be accommodated in decisions to grant the right to take and use of water;
- How water users should pay for the right to take and use water and whether differential payments should apply to different categories of water users;
- The types of sanction that should be applied to breaches of water licences.

To resolve these issues, it is recommended that water allocation policy be considered as a specific task. However, the implementation of water allocation policy requires (i) appropriate legislation and (ii) administrative resources. The legislation is required provide legal control of the taking of water. However, a process should be possible where policy is discussed and decided while legislation is being developed. Some aspects of water allocation policy need to be decided before legislation is introduced, but other policy questions need not be reflected in legislation. These categories are discussed in Chapter 3 on water policy.

Recommendation:

- That policy on water allocation be developed and formally adopted, if necessary prior to the establishment of legislation and a water allocation scheme
- That the national water committee consider the development of the water allocation policy

1.3.4 Other policy issues

There are a number of other policy issues, that are discussed further in Chapter 3. These are:

- Water conservation and recycling;
- Impact of freshwater management on the coastal zone;
- Riverine activities, excavation and dredging
- Riverine protection areas
- Consultation and participation for water management
- Aquifer protection areas.
- Water and human health;
- Environmental water requirements.

A survey is required to identify the environmental values in Fiji which are supported by water in water bodies such as rivers, lakes and groundwater. Where areas of high environmental value rely on freshwater sources, there needs to be a policy to guide the manner in which the values will be protected.

Recommendation:

- That policy be developed in the areas noted above, according to the priorities of the Government, following consideration by the national water committee and national water council

1.3.5 Policy recommendations

The following general recommendations are made on water resources policy:

- That the current interim draft national water policy be adopted after consultation, as requested by Cabinet;
- That the interim national water policy be further developed, as proposed in the water reform strategy
- That, for the time being, the national water committee develop a timetable and program for policy development with emphasis on specific issues (eg those noted above and others which may be a matter of priority);
- That the draft policy on provision of rural water supplies be considered by the Government and adopted following appropriate consultation;
- That further areas of policy be developed, as suggested in Chapter 3 of the report.

A preliminary timetable is proved in the draft water reform strategy.

1.4 Water resources legislation

1.4.1 Pilot inputs

The pilot covered water resources legislation in the following respects:

- Reviewed previous reports and proposals on water legislation;
- Identified legislative issues for water resources arising from the commercialisation and restructure of the urban water supply;
- Incorporated legislation proposals for groundwater control, as developed in the amendments to the Mineral Resources Act;
- Explored ideas on legislation at the workshop in integrated water resources management in November 2005;
- Further developed a water law framework at the workshop on water legislation in June 2006;
- Provided a final briefing to the National Water Committee in August 2006.

The outcome of these activities is the provision of a framework water legislation proposal. The proposal is provided in two forms: (i) a set of policy proposals that describe the intent of proposed legislation and (ii) more detailed drafting proposals. These documents are provided in Chapters 4A and 4B.

1.4.2 General recommendation on water law

The general recommendation is that the time is appropriate to introduce a water resources law for the Fiji Islands, that provides for the management of water resources as a specific function and responsibility of government. The law would cover the areas identified below and would clearly state the situation regarding the right of all parties to take water from natural water sources. It would also contain protective measures which complement powers in current environmental legislation.

1.4.3 Issues for water law in Fiji

There appears to be broad agreement that 'water needs to be fixed' and that legislation is a component of the solution. However, there are different reasons for thinking that water problems need a legislative solution. Perceptions include:

- The failure of the urban water supply to deliver reasonable and consistent services;
- The difficulties encountered in regulating groundwater extraction for commercial use;
- The desire to provide greater rights to native land owners, including rights related to water;
- Increasing pollution of water.

Not all these issues require legislation as such, but there are some important issues that require water law for resolution. These are:

1. the continuation and clear statement of the legal powers that enable the government to allocate water for all purposes and from all sources, and
2. the control of surface water allocation and groundwater allocation.

A critical issue for Fiji is the right of native land owners in relation to water in nature, a matter which has been receiving considerable attention. Any right of native land owners to water resources would be closely linked with the two aspects of law listed above: namely whether the government has, or should have, a legal right to control water resources, and the role of the government in allocating and therefore controlling the taking of water for all purposes. Because the native landowner issue is so important it is discussed separately below. The issue is fully discussed in Chapter 4A.

1.4.4 Native land ownership and water

Representatives of native landowner interests have raised the question whether they should be granted a right to water, which would entitle them to some compensation if others took the water for various types of use. There seems to be a fairly widespread view that the ownership of native land is, or should be, accompanied by other rights, including rights to water associated with that land. According to this idea, the land owned by native landowners includes the water which naturally occurs on the land or under it. The idea is attractive to land owners who would expect to require others to make payments, similar to lease or rental payments in return for the right to take water.

The pilot project argues that water, as a natural resource, differs significantly from land and differs in ways that make the attachment of water to land, in most cases, either undesirable or unworkable. The Government has already found that it requires the power, in its own right, to control groundwater extraction, in order to meet a number of public objectives, including the need to ensure that water extraction is sustainable, to ensure that various water uses are not in conflict and to ensure that supplies are available for public purposes such as water supply.

There are two questions, therefore:

- Whether native landowners should have a right to decide who may take and use water that flows past, through or under their land, and
- Whether native landowners should have a right (without the right to decide on the allocation of the water) to compensation from a user of water that flows past, through or under their land.

On the first question, it is important that the government continue, as now, to exercise the right to allocate water, ie to decide who takes water, from where, and in what amounts. This power is already available to the government, under the *Rivers and Streams Act*, and should be maintained. Note that an alternative legal view has been put by the Native Land Trust Board (NLTB) in its water policy paper, which argues that the water resources were never ceded to the British Crown and have therefore rested with native landowners. This view is considered incorrect and is in conflict with previous investigations of water resources legislation (such as the study by S D Clark, 1987).

On the second question – compensation to native landowners for the use of water by others – the outcome is a policy decision for the government, It would add to current imposts on commercial enterprise and could also require a differential policy depending on the type of use – ie to avoid public utilities from needing to pay compensation. This issue is discussed further in Chapter 4A.

1.4.5 Water resources law

It is recommended in the strongest terms that the Government act to reinforce the existing powers it has in law, to empower it to allocate and manage the taking of water for all purposes and from all types of

natural water source. Although the powers already exist, it is recommended that they be transferred to a modern water resources statute and enhanced by:

- Transferring the current mechanisms for surface water allocation from the *Rivers and Streams Act*;
- Adding appropriate legal mechanisms, to create an equitable and sustainable scheme for water allocation in general;
- Transferring the groundwater control powers currently being considered for inclusion in the *Mineral Resources Act*, to create the same water allocation mechanisms for groundwater taking and use;
- Including, as appropriate, legal measures for associated areas of water resources management.

Therefore, it is recommended that a *Water Resources Act*, or similarly entitled statute, be introduced, covering the matters discussed above.

It is recommended that the following areas of legislation be reviewed, with a view to enhancing or rationalising existing statutes or adding appropriate measures to new water resources legislation:

- The control of excavation and similar activities which affects the beds, banks or foreshores of freshwater bodies;
- The design and construction of works for flood protection and mitigation, along with measures for planning on floodplains to minimise the risk posed by flooding;
- The protection of special areas for water quality purposes (drinking water), subject to agreement on the appropriate statute for such protective measures

Note that the draft water policy, approved by Cabinet for consultation, contains a number of principles which would be included, for administrative guidance, in a water resources law.

1.4.6 Riverine activities

Currently, the *Rivers and Steams Act* and other legislation dealing with land contain some provisions allowing the control of excavation in rivers. Technical advice is provided by LWRM, Ministry of Agriculture, to the Surveyor-General, who is responsible for its administration.

It is desirable that the permits used to control such excavation be designed and administered according to the same legal principles that would be included in the water legislation. The scheme should require the technical evaluation of the impacts of the activities and should also include an oversight role for the technical agency. The outline of the powers for the scheme would be included in water legislation.

1.4.7 Flooding

Flooding is a periodic issue in Fiji, Much flooding is local or based in urbanised areas, but in some valleys, such as the Nadi River and Sigatoka River valleys, there is more widespread flooding from time to time. At present, various activities are undertaken to deal with floods, but there is no legislation covering some important aspects. The various responsibilities related to flooding are covered in the section on administration. Detailed proposals for flood management are outlined in Chapter 4A on legislation.

1.4.8 Water management principles

Important principles have been adopted in the draft National Water Policy. These are suitable for inclusion in water legislation as a guide to the administration of water resources.

1.4.9 Recommendations

It is recommended that:

- A water resources law be introduced;
- The water law contain the principles stated in the draft national water policy as guidelines for the management of water resources;
- The law transfer the relevant provisions in the *Rivers and Streams Act* and other provisions clearly stating that the right to the use, the flow and the control of water resources vests in the State;
- The controls currently being considered in the *Mineral Resources Act* for groundwater management be transferred to the water law (to provide a consistent scheme for both surface water and groundwater control);
- The law introduce legal mechanisms for allocating water by means of licences issued to all types of water user, including public bodies, and thereby ensure both sustainable levels of use and also the allocation of water between users;
- The law include provisions in the following areas:
 - The design and implementation of works for flood mitigation or with a flood mitigation purpose;
 - A permit system for excavation in river beds or banks or the foreshores of freshwater and estuarine water bodies;
 - The power to develop and enforce floodplain management schemes which identify appropriate locations for construction and activities which may impede the path of flood flow;
- Further investigation of the need to rationalise existing powers for the establishment of special areas for the purpose of maintaining water quality.

Note that under this proposal, native land owners' rights in relation to water would be maintained as at the present – they would have unfettered access to water locally for domestic purposes but would not control the access to water by others.

1.5 Institutional development

1.5.1 General recommendation

The general institutional recommendation is that three bodies be established by the Government of Fiji, namely (i) a coordinating and consultative body at a high level, know as a National Water Council or similar title, (ii) an administrative body responsible for water resources management be created, to implement water legislation: the body may be created in part with technical staff already undertaking

relevant tasks within the administration, and (iii) a water tribunal, a body judicial in nature, to adjudicate disputes on the right to take and use water from natural sources.

In addition it is recommended that the Government add water resources management to its ministerial portfolios, as a distinct responsibility.

1.5.2 Current situation

At present Fiji lacks an administrative focus for the management of water resources. Water management-related responsibilities have been given, by default, to the Mineral Resources Department, (MRD) because of political issues arising over the exploitation of groundwater for commercial purposes, and the potential conflict of use of groundwater in the Yaqara valley. However, an active responsibility has not been assigned, nor have the resources for water management been considered. Therefore MRD is capable only of limited interventions which must be made over and above its normal responsibilities.

This situation does not allow for the active management of water resources as distinct from the provision of water supplies. At the present time, water supply and sanitation responsibilities are being separated from PWD, precisely in order to create an organisation that can focus on urban services without being distracted by other responsibilities. That organisation will not be a water management agency, but a water service utility, more closely focused on customer service delivery than before.

There remains a need for the government's water management responsibility to be identified and enhanced. That need forms the core of the institutional recommendations of the pilot.

1.5.3 Water resources management function of government

The key to the institutional development recommendations is that a water resources management function should be created. At present some aspects of water management are being undertaken, but fragmented and without legislative backing, usually either as ad-hoc activities or by default where departments have appropriate technical expertise. This is not an adequate approach for the future. The most important step will be to develop a specific responsibility for water resources management as a distinct function of government, differentiated from water supply with which it is often confused.

The water resources management function is considered to require both political and administrative change. There needs to be a ministerial responsibility for water resources, otherwise it will not receive attention at political level, except when a specific problem occurs. The elements considered necessary are shown in Figure 2.

Figure 2: Proposed institutional set-up for water resources management in Fiji

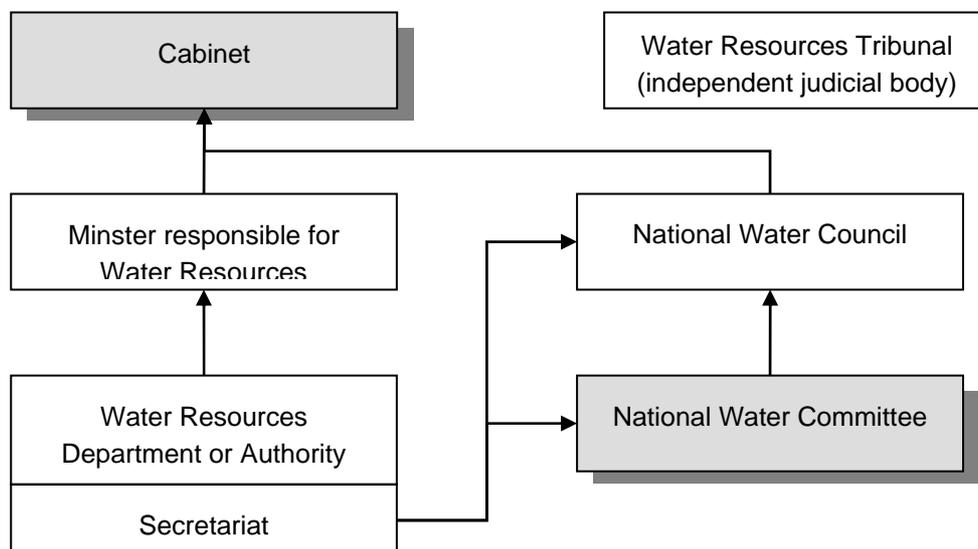


Figure 2 Note: empty boxes represent new elements

The key elements are, apart from a specific ministerial responsibility, are:

1. a national water council, to be a high level advisory body;
2. a water resources department, to administer the water allocation and other water management elements of the legislation, and
3. a water resources tribunal to adjudicate water allocation disputes.

1.5.4 National Water Council

A National Water Council is recommended as a high-level coordinating and advisory body to the government. It should report to the minister responsible for water resources. It would comprise representatives of ministries and private sector water stakeholders, such as native land owners, industry groups, and should include the CEOs of the water sector utilities (Fiji Electricity Authority and the future water supply utility).

The role of the Council would be to consider matters referred by the Government, the Minister or matters that the Council decided it should review, and provide coordinated advice to the Government. It would be advisory only, not a decision-making body. It should be headed by an independent person who is respected and can oversee discussion on water issues by stakeholders who may have very different perspectives. It is essentially a policy advice body.

The National Water Committee should continue and would perform the role of technical committee under the Council.

It is recommended that the national water council have the following functions:

- To advise the government on any matter of national significance pertaining to water resources;

- To review progress with water reform, including the establishment of the administrative elements;
- To make proposals on any important water resources issue on which the council can find agreement.

The purpose of the Council is to bring together representatives of all key organisations, sectors and interests in Fiji, to debate and agree on the way forward for water management. It is intended that the Council would undertake a number of tasks, which are:

1. to oversee the implementation of the national water reform strategy and report to the government on its progress: ie to ensure that the strategy is being implemented;
2. to review matters of policy advanced by the national water committee and advise the government;
3. to discuss matters of serious contention or difficulty which are of national importance where the Government wishes to receive coordinated advice.

The council membership is proposed to include high level representatives of ministries, water-related industry groups, sectors of society and interest groups. They should include representatives of native land owners. It is proposed that the Council be chaired by a person who is independent of the various sectors and interest groups and who has a national profile that will ensure credibility. It is important that the chair of the Council is capable of organising a group of high-level representatives and bringing advice to the Government that reflects a national consensus as far as possible. The detailed rationale and proposals for the national water council are contained in Chapter 5.

1.5.5 Portfolio allocation for water resources

It is recommended that a Minister be allocated responsibility for water resources (ie water resources management). At present no minister has that responsibility, although the national water policy has been developed through the Minister for Mineral Resources, but this is an incomplete measure.

1.5.6 Water Resources Department

It is recommended that a water resources department be created as a department or other form of government agency with regulatory powers and functions, Its role would be to manage water resources, to ensure their sustainable development, harmonious exploitation and relevant protection measures. Its role would not conflict with that of the Ministry of Environment which regulates wastewater discharges and has a general environmental protection role. Its main activities would be:

- Policy and education on water resources
- Secretariat for the National Water Council and the National Water Committee
- Surface water management – water allocation system with the issue of water licences
- Groundwater management – as for surface water, issue of water licences
- Bore drilling – issue of permits to undertake bore drilling
- Flood management – planning and development of guidelines
- Riverine and water body controls – issue of permits for excavation and dredging in rivers

- Water resources data – establishment of national water resources data bases.
- Inspectorial – monitoring and enforcement for the regulatory functions (water licences, excavation permits)

The water resources department would perform some activities which are currently with other ministries and departments, but it would have to be created by using staff from other organisations. In particular:

- Hydrology, assuming that the new water supply utility will not require the majority of the hydrologists, as has been suggested by the Asian Development Bank (ADB) project assisting the commercialisation, they could be transferred to take on a role in a surface water network for all water uses and management across the Fiji Islands:
- Mineral Resources Department, where the groundwater staff and functions could be transferred to perform groundwater management and the issue of groundwater licences, as well as permits for bore drilling. The current staff are involved in technical advice on groundwater availability and the impacts of groundwater development;
- Land and Water Management division of the Ministry of Agriculture (LWRM), where some or all of the Department (as this has not been investigated in any detail) might be transferred. Currently they are involved in the investigation of river flow, flooding, river excavation and related functions but not within the legislative framework that is required. There could be overlap between the engineering expertise used for irrigation development and the expertise applied to aspects of surface water management (such as assessment of the impacts of dams and other engineering water works).

In addition, the water resources department would require an administration unit, one of whose tasks would be to provide the secretariat for the National Water Council and the National Water Committee.

The establishment of a department for water resources, as a new and distinct organisation, is not a light undertaking for the Government. This approach is proposed, rather than adding to an existing department for the following reasons:

- Although some existing organisations (MRD, LWRM) are undertaking activities which the new department would undertake, none of them is suitable under their present charter and range of functions to be a water management agency;
- A new department would clearly indicate that a water resources management function, different from water supply, is being established and would educate government and non-government participants in the fact that integrated water resources management (IWRM) requires an active approach to water resources;
- The range of activities currently related to water resources management, including some pre-existing activities and other new or enhanced ones, needs to be brought together into one place. There is more likelihood of this succeeding by gathering them in a new organisation than by pushing them into an existing organisation, whose budgets and operational structure would constrain and possibly strangle the water resources management functions.

It is important to understand that the enhanced water resources functions have important technical requirements which in turn have a cost to them. It will be necessary to build up the technical capacity in Fiji, which is a difficult in itself. However, from the government's perspective the more immediate issue

will be the cost of such a department, which is expected to be a serious consideration, even if transfers are made as suggested.

1.5.7 Director of water resources

Currently, Fiji has a Commissioner of water, a position initially created during the colonial era which relates to approval of river diversions for urban water supply pursuant to the *Rivers and Streams Act*. The position of Commissioner could be dispensed with the introduction of new urban water legislation to set up a commercial utility. The Director of Water Resources (or similar title) would be responsible for the Water Resources Department, but would also be the issuing authority for water licences, bore drilling licences and permits to excavate in rivers. Some approvals of the Director would be able to be appealed to the Water Resources Tribunal. It is considered undesirable that the Minister be the sole approving authority for the bulk of water licences and other permits because of the number of them and the scale of most of them. This would be consistent with the issue of wastewater discharge permits by the Ministry of Environment.

1.5.8 Water Resources Tribunal

The Tribunal is a judicial body proposed for resolving disputes between water users and allow appeal against determinations of the director of water resources in the matter of water licences which give the holder a water entitlement. The tribunal is proposed to have similar features to the tribunal proposed for mineral exploitation, namely a judicial officer to preside and two or more expert members, who must be independent of the administration. The determinations of the Tribunal would be final except that appeal to the High Court would be allowed on points of law.

The purpose of the Tribunal is to allow the decisions of the Director of Water Resources to be questioned and evaluated. It may also be called upon by the Director to resolve disputes which are not amenable to negotiation between parties or by the intervention of the Director.

1.5.9 Regulatory framework for water supply

The water supply functions of PWD are to be made a separate utility whose formal organisational structure was not decided at the time of the pilot. Regardless of the precise details of corporate structure, and regardless whether the utility is publicly or privately managed or owned, the regulatory requirements remain the same. The utility needs to be subject to formal regulation of the key aspects of its operation and services, as shown in Table 1.

Table 1: Regulatory framework for urban water utility in Fiji

Regulatory requirement	Current or proposed response
Service provision – supply of water to consumers	Service regulation involving standard to be met for water supply and sanitation – agency not determined
Price regulation	As at present, the price commission
Drinking water quality	As now, specification of drinking water standards and monitoring by Ministry of Health

Sewage discharge	Subject to permits issued and monitored by the Minister of Environment
Access to water – water allocation	Not currently done: proposed Department of Water Resources for all sources, surface water and groundwater under water licence/s
Control of drinking water catchments	To be decided, possibly land to be owned by another agency, but physical control by the water utility

The water resources management proposals are consistent with and important for the commercialisation of the urban water supply in Fiji, in regard to the following:

- The control of water supply catchments which are needed to protect the quality of water entering and stored in reservoirs;
- The legal right of the water supplier to take water without the likelihood of claims or interference with the sources (eg upstream development);

1.5.10 Implementation

It is recommended that the institutional proposals, which are a part of the proposed water reform strategy be progressively evaluated and implemented. The first two decisions for consideration are (1) portfolio allocation for water resources management and (2) the establishment of the National Water Council.

In deciding whether to establish the National Water Council it is also necessary to consider whether to create a water secretariat to support it. If no secretariat is to be created, it is recommended that the Council proposal be put on hold as it is not expected to be effective without resources and support. In fact, the secretariat is a vital prerequisite for the Council's operation.

The creation of a department of water resources requires further investigation of staffing, technical resources, and the budgetary consequences. At this stage, the Government could be asked to consider whether it agrees:

- that the functions identified for a water resources management regime should be enhanced or introduced;
- if so, whether a Water Resources Department should be developed (recommended), or the functions be undertaken in some other way (less recommended).

Should the Government decide in-principle to proceed with establishing the Water Resources Department, a donor might provide assistance. There is further discussion of department the establishment issues in Chapter 5.

1.5.11 Specific recommendations

The pilot recommends that:

- a Minister be given responsibility for water resources (management) – this is separate from responsibility for water supply (which should be under a different minister);

- a National Water Council be created, which advises the government on water resources issues and includes representatives of the key ministries plus major non-government stakeholders and is headed by an independent person;
- the National Water Committee act as the technical committee to the National Water Council and that a secretariat for the Council and Committee be established (which would be located in the water resources department);
- a water resources department be established to undertake the functions provided in the water management legislation;
- a Water Tribunal be created, to review water allocation decisions (similar to the proposed tribunal for mining).

These recommendations are shown diagrammatically in Figure 2. The only elements in Figure 2 which currently exist are the Cabinet (no minister has formal responsibility for water resources) and the National Water Committee. The Mineral Resources Department (MRD) is taking responsibility for the relevant initiatives, namely the national water policy and legislation, but is not resourced for a water resources management role, nor has it the formal mandate.

1.6 Water resources information

1.6.1 General recommendation

The key recommendation is that the Government of Fiji establish national data bases for surface water and groundwater to facilitate the assessment of water resources, for the purposes of planning and managing the resources.

The data bases should be coordinated by the Water Resources Department and some of the data may also be held by that department, although it is inevitable that various relevant data will continue to be collected, archived and managed by other organisations.

1.6.2 Current situation

Currently, data related to surface water is collected by (1) the Meteorology department, (2) the hydrology department of the Public Works Department and (3) the Land and Water Resources Management division of the Ministry of Agriculture. The data currently collected covers a considerable part of the larger islands of Fiji. The chief deficiency is the lack of mandate to provide data for national planning purposes. The Meteorology Department's mandate is the only one that extends throughout the Fiji Islands. The other surface water-related data is collected for specific purposes, namely by PWD inland data for water supply purposes and LWRM data for estuarine zone measures.

An initial proposal is that the core of the data collection and archiving staff of PWD and LWRM should perform the new national surface water resources data function.

Groundwater data is collected and archived by MRD. This data forms a partial picture of groundwater resources in Fiji, the main deficiency being that data collected by the private drillers is not included. That is proposed to be addressed by introducing bore drilling regulation and certification. The MRD groundwater data function can readily form the basis for a national groundwater resources data base.

Water quality data is collected by a number of agencies and is more fragmented than the physical data for surface water and groundwater. MRD collects data on water quality as well as quantity, as do PWD (for water supply) Ministry of Health and the Ministry of Environment. Much data, however is collected in the course of specific projects or investigation of issues and is contained not in database form, but in various reports. Both the Ministry of Environment and any future Water Resources Department would have an interest in national water quality data.

The key recommendations are:

- Establish mandate for national surface water data and groundwater data in Department of Water Resources
- Transfer existing data resources from PWD, LWRM and MRD to establish database and association functions
- Initiate programme to improve inter-agency coordination on water quality information with a view to developing data agreements and a data custodian role for that data
- Further investigate the data and information requirements for water resources management, including the technical facilities and human resources requirements.

These recommendations involve some administrative and technical realignment and need to be developed further. The details of the information recommendations are given in Chapter 6: Water Resources Information. For this reason, it is advisable that a technical review of water resources data needs in Fiji be undertaken, to identify what data requirements would satisfy Fiji's water management objectives.

1.7 Water resources and planning

The pilot investigated the need for the introduction of new forms of planning for water resources management. Two areas in particular were identified, namely water allocation and floodplain management for possible planning mechanisms which go beyond current planning mechanisms.

The key fields for planning are discussed below.

1.7.1 Planning and water allocation

A water allocation scheme should be accompanied by the means to undertake a form of statutory planning for the allocation of water for all purposes. Although such planning may only be required in cases of serious conflict, measures would be required within the relevant legislation to develop such plans. Formal or statutory planning for water allocation can contain the following measures:

- Within a river system, identification of the volumes of water available for various water users or types of water use;
- Statement of rules for ensuring flow for environmental purposes;
- Statement of priorities among water users in circumstances of low flow or water scarcity;
- Statement of rules for operation of dams and other structures in circumstances of low flow or water scarcity;
- Identification of potential future opportunities for development of water resources.

The same approach can be applied to groundwater as to surface water sources such as rivers. For groundwater, the plan would state such parameters as:

- The drawdown levels or water table levels at which water extraction should be limited or should cease;
- The volumes that various water users may take and the rates at which the water may be taken;
- Various technical criteria such as minimum distance between bores;
- The rules that would apply if the water was drawn down to a level at which water access or other values were potentially threatened.

Such plans are based on the technical assessment of water resources and water demands, including such aspects as (for surface water) annual and seasonal flow and yield, and the impacts of water diversion and storage on instream and other values, and (for groundwater) the volumes, behaviour and recharge characteristics of the aquifer. Plans that deal with water allocation are also normally developed through a process which involves consultation or negotiation about the conditions that will apply to various water users and the consequent implications for the long-term reliability of their access to water.

It is not considered likely that statutory planning for water allocation would be needed in many locations, but in a few locations it could be an important tool for the government.

1.7.2 Floodplain planning

The pilot identified a need for an integrated floodplain management capacity, which links upstream and floodplain flood features. There are a limited number of river floodplains in Fiji where a broad floodplain approach would be advantageous. The Nadi River valley is the most prominent example because of the degree of development that has already occurred in the valley and on the floodplain.

An integrated floodplain management scheme would contain the following elements:

- Technical assessment of the upper catchments and the characteristics of streamflow in the major tributaries;
- Modelling of typical flow events, to identify the likelihood of flooding occurring in the middle and lower reaches of the river valley;
- Flood mapping or equivalent technology to show in what locations and how frequently floods are likely to occur;
- Active and preventive measures to minimise the impacts of flooding in those locations where floods are known to be likely to occur (ie at return periods of 5, 20, or 50 years);
- Planning for residual risk – the risk that remains after measures have been put in place to mitigate the impacts of floods within the 50 year return period range or whatever period is chosen as the standard for flood protection.

Note that flood response measures, which form part of disaster response, are of a different nature to most of those noted above. Flood response involves the planning for evacuation, rescue and protection of property immediately before, during or after a flood event. The management of residual risk includes flood response measures for a flood greater than the flood for which protection works have been constructed.

Longer term flood management measures are those which involve structural and non-structural means for reducing or eliminating flood risk in the longer term. Various measures that may be taken to protect against flood damage and mitigate flood risk are either active or preventive. Active measures include construction of dykes and levees, use of dams to reduce flood peaks or store flood waters, diversion of floodwaters into retention areas, and creation of flood ways – areas which enable flood waters to drain readily. Preventive measures include the identification of land which should be kept free of certain types of development because:

- The land is important for flood flow and the drainage of flood water;
- The land will not be protected against relatively frequent flooding and therefore the value of development on that land should be limited.

The existing urban and rural planning system, established in the *Town and Country Planning Act*, has the capacity to control development on floodplain to achieve such goals. However, in order for such floodplain planning to be effective, there needs to be a process for developing flood plain plans which include the following elements:

- A technical assessment of flood events that identifies the frequency, depth, velocity, direction and location of floodwaters (which may require modelling);
- Flood maps, based on the assessment, that identify where and how frequently floods are likely to occur;
- A scheme of flood protection works and identified floodways or areas where floodwaters should be allowed to flow without impediment;
- The associated design criteria for the construction of buildings, physical barriers and roads.

Such plans require trade-offs between several types of interest, chiefly (i) the protection of existing property, (ii) the provision of areas for flood flow or flood diversion, and (iii) the opportunity for future development and the areas in which such development should be allowed. Therefore the process of planning becomes very important as land potential and value will be affected by the planning measures.

Recommendations:

- That a floodplain planning scheme be introduced that provides the framework for minimising adverse flood impacts on property and enterprises by identifying:
 - The location of flood protection works;
 - The land which should not be developed and the conditions which should apply to development on other land
 - The construction and design criteria for development in flood prone areas.
- That the capacity of the *Town and Country Planning Act* to apply and implement the scheme be investigated and if necessary that Act be amended
- That steps be taken to develop the expertise and obtain the modelling capacity to undertake the technical investigations on which a floodplain plan would be based.

1.7.3 Establishment of protected areas and associated planning

Planning for protected areas refers to plans made for limited land areas which are specifically set aside or identified to protect and maintain the quantity and quality of water resources. Protected area planning differs from the planning undertaken for catchment management – which involves the coordination of settlement and activities to be compatible with maintaining water quality across a large area that drains into a water source or water body such as a stream or river. Protected areas are established around or upstream of reservoirs or sources of water used for water supply, where it is advisable to maintain high quality. Such areas are normally limited to land surrounding a reservoir, in the area immediately upstream of a reservoir or land above an aquifer, for the protection of groundwater.

Measures have already been developed (currently being considered), as amendments to the *Mineral Resources Act*, for protecting the quality of groundwater, although implementation procedures and criteria have not yet been developed. The proposed amendments would grant to The Minister the power to declare a management area and to disallow specified activities within that area. The proposals are at the stage of consideration by Parliament.

The ability to establish and control special areas to protect water supply sources is important in light of the commercialisation of the water supply. The water supply, under the *Water Supply Act*, has a number of existing ‘catchment areas’ which may require transfer to another agency. Any future protected area would require (i) a legal basis on which the area is set aside for the purpose, (ii) a legal means for assigning the control of the area to an agency, and (iii) enforcement powers.

A deficiency in the provisions of the *Water Supply Act* is the absence of enforcement provisions enabling the water supply organisation to control access to and activities within the special areas. Such powers are needed somewhere. A policy decision is still required as to whether (i) the ownership of the areas and (ii) the powers to control the land, should be included in the legislation that establishes the new water supply entity. The legislation in Fiji needs to include powers that allow special areas to be established, for the protection of land from activities which would cause pollution or degradation of water sources, whether the legislation be the water supply legislation or water resources legislation.

Planning for special protected areas is relevant where there is a need to limit certain activities but not to proscribe all activities or prevent physical access. The levels of protection can be broadly characterised as follows:

No entry permitted except to those who are assigned to manage and protect the area	Total exclusion, highest level of protection (eg Sydney and Melbourne ‘inner’ catchment areas)
Entry permitted on a controlled and non-permanent basis only	High level protection equivalent to national park
Controlled or limited agricultural or forestry activities permitted	High to medium level protection
Controlled or limited settlement permitted	Medium protection level
Normal settlement and agriculture permitted but polluting activities proscribed	Protection only from the most severe threats

Naturally, issues of the right of landowners and others to use land may arise where special areas are established.

There are also provisions in the *Land Conservation Act*, which extend to the creation of catchment areas, for the purposes of protecting the condition of land, water, vegetation, soils and natural resources, similar to the *Water Supply Act*, there are no enforcement powers enabling protection from entry or prevention of activities which are contrary to the specifications of the catchment areas. However, it is not proposed that the *Land Conservation Act* provisions be moved, but that, if deemed necessary, the relevant control powers be added. This issue is discussed further in Chapter 4A on legislation.

Recommendations:

- That a power to establish water resource protection areas be included in the water resources legislation, to include areas for protection of surface water and groundwater sources, and the provisions be equivalent to those currently proposed for amendment of the *Mineral Resources Act*;
- That a procedure for consulting and developing an appropriate management plan for of special areas be included in the legislation;
- That the establishment of protection areas be accompanied by appropriate power to control proscribed activities.

The details of proposed legislation and implementation issues, such as enforcement and discussed in the chapter on legislation.

1.7.4 Riverine protection and management planning

Two factors affect the natural health of rivers and streams, which are (i) the condition of the land adjacent to the river or stream and (ii) the condition of the beds and banks of the water body. A comprehensive river health programme involves the protection of land adjacent to rivers as well as the control of activities in the river such as excavation and alteration to beds and banks.

There are three possible technical approaches to the control and management of these areas, which are (i) individual assessment of the impacts of an activity or proposal, (ii) standard management rules for all streams and rivers, and (iii) planning based on the assessment of a specific area.

A plan for riverine control or management would specify in what areas certain activities or remedies should be applied, for instance areas to be vegetated or protected, or the extent to which material may be removed from specific stretches or river or locations in the river. Such a plan, if required to be followed, would govern the management of rivers and riverine areas.

A combination of approaches is normally advisable. Among these, the facility to create plans that can be used to regulate activities would allow critical areas to be managed more simply.

Recommendation

- The legal facility to create water management plans should include plans for riverine management, to include the protection of riverine land and the beds and banks of rivers and estuaries.

1.7.5 Recommendations on planning

The following recommendations, in summary, are made on planning and water resources management:

- That the power to create statutory plans for water management purposes be included in the water resources legislation with a view to plans for the control of activities:
 - Water allocation,
 - Riverine and estuarine activities and controls,
 - Protection of special areas;
- That the *Town and Country Planning Act* be reviewed to ensure that it is suitable for developing floodplain plans
- That enforcement powers be introduced to the appropriate legislation to empower control of activities in (existing and proposed) special areas for water quality and quantity protection.

1.8 Technical capacity for water resources management

1.8.1 General issues

Adequate technical capacity is one of the key requirements for the introduction of a comprehensive water resources management function in Fiji. Limitations in knowledge and understanding of water resources also limit the ability to manage successfully. Technical capacity, along with finance, is a severe constraint for South Pacific countries in general and one which has already received considerable attention.

There are two aspects to technical capacity and water resources in Fiji. The first is the technical expertise and capability in areas which already developed to some extent but which need to be developed further. The second is technical capacity in new fields.

Areas in which technical capacity already exists include: assessment of surface water flow, assessment of the impacts of riverine excavation and assessment of the impacts of groundwater exploitation.

The water resources management proposals in this report would require technical assessments to be made systematically in a number of areas which are currently covered to some extent but where an enhanced capacity might be required, namely:

- Proposals to take water from streams and rivers and the impacts on (i) other water users and (ii) the environment and the sustainable level of exploitation of the source;
- Proposals for groundwater extraction;
- The extraction of material from river beds and banks.

The second aspect is where technical capacity needs to be developed from a starting base, or where no agency is presently responsible for providing it, nor is it being provided in any regular manner. These areas are:

- Impact of freshwater on the coastal zone.
- Flood modelling, flood mapping and identification of flood frequency and risk;

1.8.2 Surface water abstraction

Ideally, the following would be investigated in any case where a developer (public or private) wished to obtain the right to take water from surface water sources:

- The flow regime and the likelihood over the long and short term that water will be available at the location where the water is to be taken;
- The impact on the flow of taking the water as desired by the water user, including the impact on existing water users and on the environment;
- The impact of water taking on the quality of the water in the river.

The answers to these questions require hydrological, water chemistry and aquatic biological expertise and these disciplines need to be exercised in combination.

The investigation requirements for groundwater extraction are similar in general nature, requiring assessment of the following:

- The location, quality and behaviour of groundwater,
- The recharge characteristics of aquifers,
- Assessment of the impacts of groundwater development on the quantity and quality of groundwater.

Note that, apart from more extensive groundwater reserves on the larger islands, there are numerous small and shallow aquifers on low-lying islands which may perform a useful function as water supply, but which also require careful protection from pollution and over-pumping and the identification of the protection measures demands a knowledge of the behaviour and water quality characteristics of the groundwater.

1.8.3 Investigative capacity

Investigative capacity exists currently in the following agencies:

Table 2: Existing technical capacity in Fiji

Technical capacity	Where located
Meteorology and surface water hydrology	GMD, USP
Surface water hydrology	GMD, PWD, LWMD, USP
Hydrogeology	MRD, USP
Groundwater drilling	MRD, private sector (unregulated)
Riverine geomorphology	LWMD
Estuarine morphology and	LWMD
Flood investigation	LWMD
Flood modelling	N/A (although possibly to be developed by

Technical capacity	Where located
	LWMP)

1.8.4 Technical capacity proposals

The technical capacity proposals in this report have three elements: (1) institutional, (2) technical resources, and (3) human resources.

Institutional proposal

There is a very compelling argument for creating a technical unit within the government administration which contains some expertise in all the areas listed above. Such a unit would need to be created, as there is no such a unit at present. The logical location for the unit is within the proposed water resources department.

It is very important that, in any decision on the establishment of a water resources department, the creation of a technical unit within that department be a priority. The capacity of Fiji to manage its water resources will hinge, among other things, on the capacity to investigate and resolve the technical questions that arise in development decisions.

There is a global debate on the merits of public versus private provision of services. It is for this reason that the urban water supply is being commercialised – in order to give it a structure that conforms to private sector models, along with the appropriate incentives. However, the provision of technical expertise is a different matter.

There are three sectors which may contribute to technical capacity, namely (i) the public administration, (ii) private sector, and (iii) the education sector, in particular universities and tertiary institutions. The key question is to what extent the government of Fiji should rely on each of these sectors.

The public sector is already providing expertise in most fields, although not in a coordinated manner and not to the extent that would be ideal. Therefore it is possible to both consolidate and build up existing expertise in the public sector.

The private sector within Fiji or the South Pacific region is not sufficiently developed to provide technical expertise as would be required (ideally) for the water management tasks identified in this report. Therefore Fiji, as other South Pacific countries, has relied on international experts to provide the analysis. Such external intervention will always be appropriate to some extent, but should not replace the essential management requirements of the government. In particular, the government needs to maintain sufficient technical expertise to be capable of evaluating external technical investigations and reports.

The education sector does not currently possess or provide major technical support for water management, except in specialised areas, but in these cases, which involve the participation of academic experts in projects, the support is not sufficient to maintain or replace the ongoing capacity that the government needs. Nevertheless, the strategy for Fiji should have an educational element and there should be a two-pronged approach, to build up and coordinate capacity within the administration and within the tertiary education sector.

The reasons for aiming to create a technical unit which contains the key technical expertise for water resources are:

- The Government of Fiji needs to be confident that it has the basic capability for assessing studies, investigation and proposals which are provided by international or non-government experts;
- The planning and control of water resources and activities requires a core of technical expertise sufficient to maintain capacity for national purposes;
- A technical unit is needed to develop technical policy and advice on management matters which should not be left to external providers.

Further discussion of the technical unit is given in Chapter 7.

Technical resources

Technical resources include the hardware and software used in the course of technical activity. These are a less difficult issue, as they can be obtained by various means, including donor projects. The important questions are (i) deciding what is appropriate and (ii) maintaining the staff to use them.

Departments already have experience in the procuring of sophisticated equipment, such as drilling rigs and computer programmes. Some general areas of likely need are identified in the chapter on technical capacity, but there would obviously need to be technical assessment of the precise requirements in each case, such as flood modelling for example.

Human resources

Fiji, in common with other South Pacific countries, is limited by the number of home-grown professionals with the required expertise in technical fields. There are difficult and longstanding social and economic reasons for this deficit which need not be explained in detail here. Approaches taken to overcome the shortage of local professionals include (i) reliance on internationally-funded projects and (ii) the employment within departments of professional staff from other countries.

Human resources strategy should include the following elements, as discussed in Chapter 7:

- identifying local tertiary training needs and promoting the development of tertiary courses in key areas of need,
- developing plans for staff exchange and cooperation with appropriate organisations in other countries;
- an inventory of existing technical skills and identification of (i) current requirements and (ii) future technical requirements and timing;
- active technical succession planning in the key technical fields.

Fiji is well placed to provide services to neighbouring small island countries. Although it may seem to be at odds with logic to suggest Fiji should consider exporting expertise at a time when its own expertise needs to be strengthened, the use of technical staff, periodically and as appropriate, on technical tasks in neighbouring countries would have the following advantages:

- broadening of knowledge and expertise;
- capacity building in the neighbouring countries;
- potential external sources of finance for maintaining local technical capacity.

This proposal is discussed in detail in Chapter 7.

1.8.5 Recommendations

It is recommended that:

- A consolidated technical unit for water resources be established covering fields relevant to:
 - Surface water and groundwater allocation and development;
 - Environmental impacts of water use and development;
 - Riverine activities and riverine protection;
 - Flooding and floodplain management
 - Estuarine management.
- A human resources plan be developed by the National Water Committee, based on the proposals contained in Chapter 7.

1.9 Water resources awareness and education

Awareness and education for water resources management in Fiji needs to be developed at a number of levels:

- **Political level:** members of Parliament and their advisors need information and understanding about the nature of the water issues presently facing Fiji;
- **National administration:** information and education on water policy and the technical and social aspects of current water issues need to be promulgated within the key central agencies and the line ministries which have functions related to water resources;
- **Province level:** there is limited information on water resources management and the key concepts of IWRM at the provincial level. Improved understanding is important, in two respects: (1) the provincial councils need to understand clearly the impacts of developments and water schemes that they are promoting or participating in , and (2) provincial councils are the key promulgators of information to villages and local levels, for education of rural people generally;
- **Urban populations:** information on water conservation and the disposal of waste needs to be distributed and education in these areas improved, although there are some programmes in place already;
- **Rural populations:** there are numerous water issues for different rural settlements, which include:
 - The management and maintenance of local water supply schemes;
 - Water conservation and saving water;
 - Local disposal of liquid and solid waste and water pollution;
 - Water quality and human health

A mixture of strategies is needed to address all these information and education requirements and action is needed on the part of a number of agencies, as shown in Table 3.

Table 3: Possible education and information strategies for water resources in Fiji

Strategy	Agency	Target audience
IWRM awareness and current water issues	Water management agency/ other national line agencies	Ministries and departments, provincial councils, major stakeholders groups including water users
IWRM awareness and current water issues	Water management agency, Prime Minister's Office	Politicians and advisors
Water conservation and wastage of water	Water management agency, Fiji water corporation, provincial councils and village leaders, NGOs	Fiji water corporation, urban water users and rural water users
Water conservation and irrigation management	Water management agency, Ministry of Agriculture	Irrigation scheme operators and farmers
Waste disposal and water pollution	Ministry of Environment, Fiji water corporation, water management agency, provincial councils and village leaders, NGOs	Industry, urban water users, and residents rural water users and residents
Water resources and health	Ministry of Health,	Rural residents, urban residents
Freshwater and the coastal zone	Water management agency	Rural populations
Water resources and the environment	Ministry of Environment, water management agency	Industry, developers, urban and rural populations
Management of rural water supply and sanitation schemes	Ministry of Environment, water management agency, Public Works Department (Regional Development)	Rural villages

Further details of the proposed information and education strategy are given in Chapter 9.

1.10 Outline of reform strategy proposal

In addition to the matters covered in this chapter, the pilot has developed a proposal for a water reform strategy, which, if implemented, will assist the Government of Fiji to establish a comprehensive water resources management capacity. The elements of the strategy follow the outline provided in this report, which is the summary of the recommendations in all areas.

The further chapters of this report are:

Chapter 2A	Draft water reform strategy
Chapter 2B	Draft action plan for water reform strategy
Chapter 3	Development of water resources policy
Chapter 4A	Rationale for water resources legislation
Chapter 4B	Draft water resources legislation
Chapter 5	Water resources institutional development
Chapter 6	Water resources information
Chapter 7	Technical capacity for water resources
Chapter 8	Planning issues and capacity for water management
Chapter 9	Water resources awareness and education

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