# THE MANAGEMENT OF WATER RESOURCES IN PAPUA NEW GUINEA

By Brian J. Bargh, Bureau of Water Resources, Department of Minerals and Energy, Konedobu

## INTRODUCTION

In Papua New Guinea there have been laws to control the use of water since 1962. However, not many people took notice of these laws. The illegal use of water was generally ignored. For example, although it was illegal to put waste materials into water without a licence, only one licence existed before 1982!

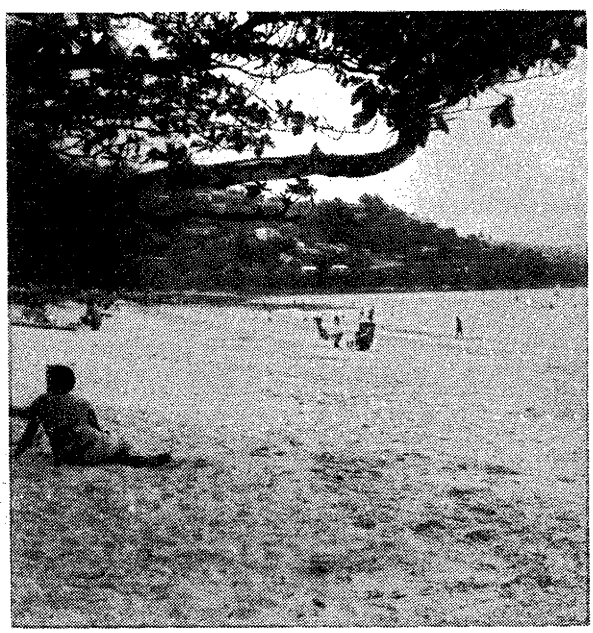
In 1982, the government brought in new laws to control the use of water in the form of 'The Water Resources Act, 1982'. This article explains how this Act should help Papua New Guinea manage its water resources. The part the Bureau of Water Resources plays in this is described.

## PROBLEMS WITH USING WATER

Because Papua New Guinea is lucky enough to have plenty of water, people assume that there will always be plenty. However, more and more industries are using water for processing and waste disposal.

The largest water user in the country is the Bougainville Copper company. BCL uses 90 million cubic metres ($m^3$) of water per year in the copper and gold ore processing plant. This water becomes poisoned with chemicals used in the processing. It is discharged into the Jaba River, polluting it and making it useless all the way to the sea.

Port Moresby city uses about 30 million $m^3$ water per year - a third of the amount used by BCL. About a third of this is discharged as sewage wastes either through the Waigani sewage treatment ponds to the Waigani swamp, or into Port Moresby Harbour. Much of the Moresby sewage used to be pumped into the sea at Paga Point and polluted the popular Ela Beach. It is now piped further out into the harbour.



*Ela Beach, Port Moresby, is once again a popular spot for recreation. For a long time it was badly polluted with sewage*

The oil palm factories at Kimbe, Bialla and Popondetta each use about 2 million $m^3$ of water a year. The two largest coffee factories, Gumants and Wahgi Mek, each use about half this amount.

In all cases the water becomes highly polluted and is then discharged into nearby rivers or the sea (Bialla) causing problems for other water users.

Sewage, coffee and palm oil processing wastes are examples of organic wastes. When these are discharged untreated into rivers they can cause death of river life (they reduce dissolved oxygen levels in the water), increased growth of water weeds (because of the nutrients they contain) or human health problems.

## THE WATER RESOURCES ACT 1982

The Water Resources Act consists of a number of laws to control the use of water in Papua New Guinea. Everyone in the country comes under these laws.

Some uses of water are not covered by the laws. These are:

Domestic use, e.g. small pumps from rivers or wells supplying stock water on farms or drinking and washing water for houses.

Recreational use, e.g. boating, swimming, picnicking.

Traditional use, e.g. irrigation of food gardens, canoe transport, village water supply.

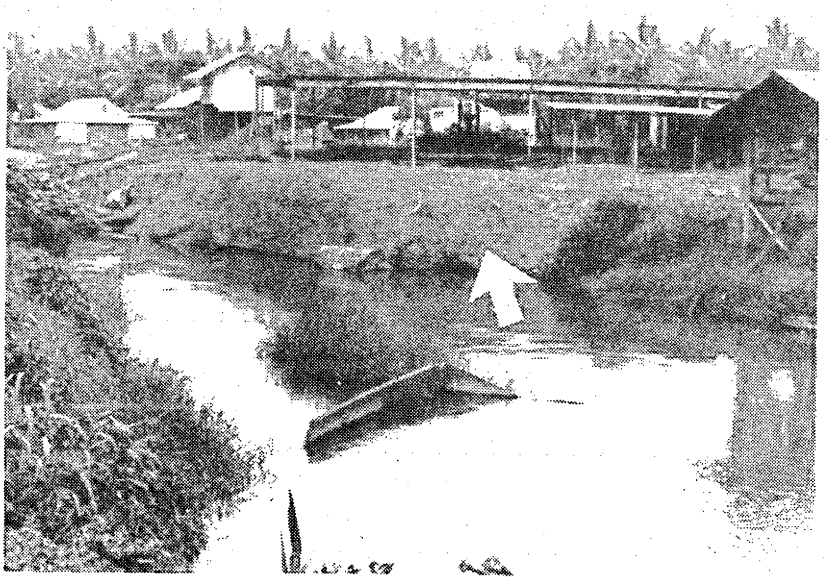
A group of 13 people - the 'Water Resources Board' - has the job of deciding the best ways to manage water resources under the 1982 Act.

The Bureau of Water Resources carries out the policies of the Water Resources Board. The Bureau consists of a Director and technical staff.

Some of the things included in the Water Resources Act 1982 are described here:

### Water Use Permits

If you want to use water for a purpose which is not domestic, recreational or traditional, you must have a permit. You must apply for a permit to the Water Resources Board. They decide whether or not to give



*Pollution of the Aropa River by sawdust (marked with an arrow) from a nearby mill*

you one. Their decision depends on:

- Who else uses the same water?
- Will other people be affected by your use of the water?
- Is there enough money to complete your project?
- How will your water use affect the environment? Will it cause pollution?

All applications for Water Use Permits are advertised in the newspapers. The Water Resources Act 1982 provides for a public hearing of applications for Permits. Any member of the public may speak.

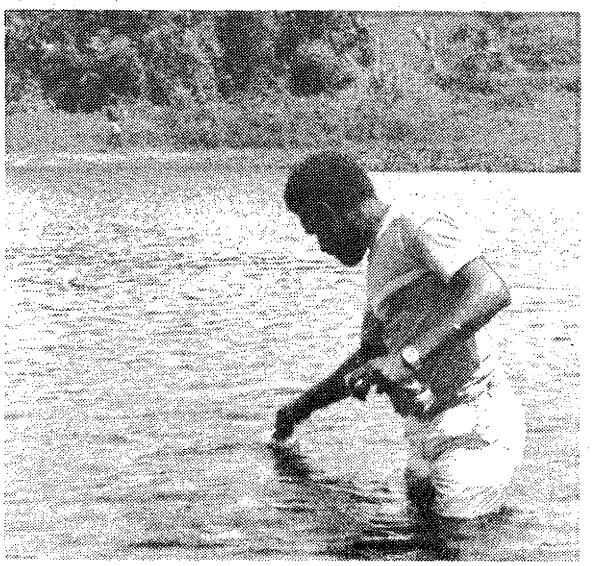
Finally the Water Resources Board makes a recommendation to the Minister for Minerals and Energy to issue a permit or to refuse one.

If you are not happy with the Minister's decision you can apply to have the decision changed. You can do this if you think you will be affected by the water use. For example, the Papua New Guinea Electricity Commission may be given a Permit to dam a river upstream of where you use water for washing and for supplying your small piggery. Even after the Minister has granted the Permit against your wishes, you still have the right of appeal.

## Water Investigation Permits

Other people can carry out investigations into water use, but they must get a permit from the Board. The Bureau of Water Resources has to approve of the investigations. All data must be shown to the Water Resources Board.

Investigations are usually carried out in connection with large projects like mineral ore processing works, fish canneries, timber processing factories or hydropower projects. Usually the people are investigating what the quality or quantity of water is at present and how this will be affected by the project. Flows may be measured and samples taken for water quality.



*Sampling to check a river for bacterial pollution in Kieta, where pollution from squatter settlements is high.*

## Charges for using water

If you want to use water, you must pay for it. The revenue collected goes towards funding the Bureau of Water Resources. This is one way to stop industries from using too much water.

The basic charge is 0.1 toea per $m^3$, but different uses of water are charged at different rates. For example:

Public water supply:
- basic rate (0.1 toea/$m^3$)

Trickle irrigation:
- 1/10 basic rate (0.01 toea/$m^3$)

Water for hydropower:
- 1/10 basic rate (0.01 toea/$m^3$)

If you use water for disposing of waste materials, the fee depends on the amount and kind of waste.

Materials like sewage or meat processing wastes, contain pathogens (disease-causing organisms). A higher charge is made for disposing of these. Materials like coffee and rubber processing waste do not contain pathogens, so the charge is less.

## Water Quality Standards

In Papua New Guinea, 90% of the people live in rural areas and use water from springs, rivers and creeks for their everyday needs. So it is very important to keep this water clean. Already it has been found that a lot of the water in rural places is unsuitable for drinking because it is polluted by the faeces (dung) of domestic animals.

Papua New Guinea has water quality standards about the same as those recommended by the World Health organisation. The new laws allow for a 'mixing zone' downstream from where the water is being used. The size of the mixing zone is decided separately for each water user. Below the mixing zone, the water in the river or creek must meet the Water Quality Standards.

## Offences

Anyone who breaks the laws in the Water Resources Act, can be fined up to K5000 plus up to K5000 per day until they obey the rules.

Anybody who uses water without a Permit is breaking the Law. Many coffee factories are discharging pulp into rivers illegally. Sawmills are putting sawdust and oil into rivers. Hotels may be pumping sewage into rivers. An oil tanker may run aground and allow oil to escape into the sea. Gold miners may pump water from a river to use for sluicing, and this is also an offence.

## Collecting information

The Water Resources Act states that the Bureau of Water Resources must collect and store information about water. Anyone interested may look at this information. Data such as rainfall and river flow records, and water quality information are available. For example, DPI makes use of this information when new agricultural projects are being planned, or land evaluated, or Elcom uses it to build new hydropower schemes.

## Water control districts

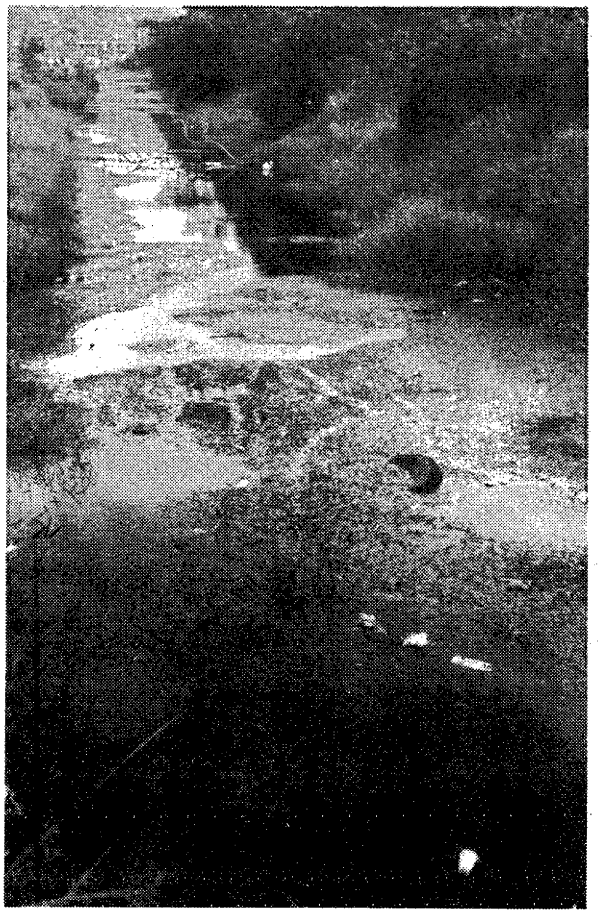
The Minister for Minerals and Energy can declare a certain area a 'water control district'. It is then forbidden for anyone to light fires, cut the forest and so on. The cleanest water comes from forested and unburnt areas. This law can protect forested areas to give clean and long lasting water supplies to towns.

## Private prosecutions

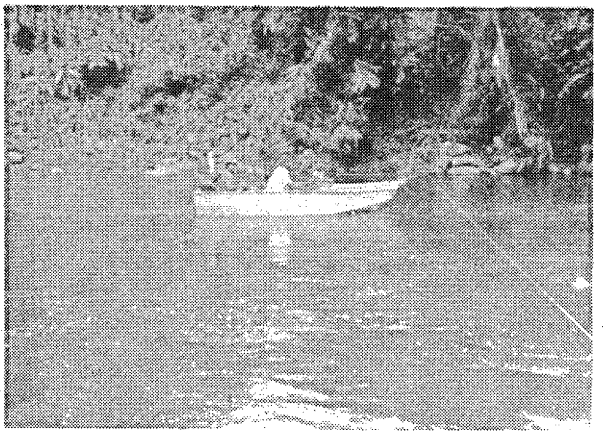
If you think someone in your area is breaking the water laws, you can take him to court yourself. There is no need to report a case to the Water Resources Board before taking action.

For example if a coffee factory in your area is putting pulp into the river you can report this to the Water Resources Bureau or directly to the court. Another example may be where someone cuts your stream flow and diverts it to his land.

In cases like these you can prosecute these people directly.



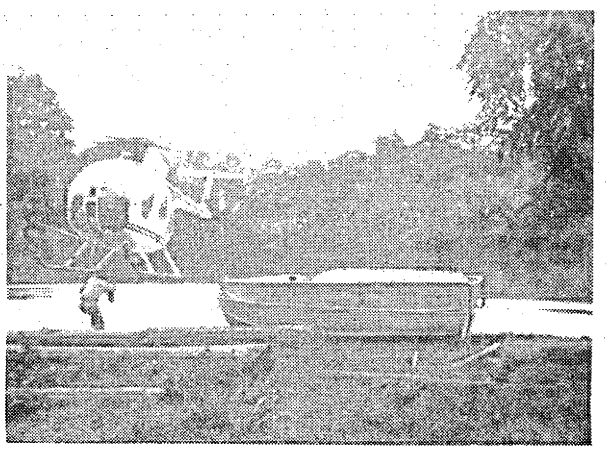
*A badly polluted stretch of water*



*Measuring the flow of a deep river from a boat*

*Flow in small rivers is measured by hand held instruments*

*Equipment used to measure river flows*



*Samples of river water for checking pollution are taken by helicopter in remote areas*

## THE BUREAU OF WATER RESOURCES

The Bureau of Water Resources carries out the day-to-day management of the Water Resources Act. It has two main functions.

1. Collecting information about water resources

A staff of up to 30 Papua New Guinean technical trainees, and 8 overseas officers carry out the following jobs:

(a) putting in river water level recorder stations and rain fall recorder stations, and keeping them working properly.

(b) carrying out measurements of water flow.

(c) designing a computer system for storing data and putting it in the form in which users need it. The people who use the data include hydro-power planners, water supply engineers, and waste disposal experts.

(e) Training new staff.

2. The Water Use Permit System

Qualified staff work with the Water Use Permit System. Their jobs include:

(a) receiving Water Use Permit applications, and making recommendations on these to the Water Resources Board.

(b) providing technical advice on waste disposal for a variety of new projects (for example, coffee factories, oil palm and rubber processing).

(c) making policy recommendations to the Water Resources Board.

(d) collecting water quality data for people who ask for it.

(e) carrying out inspections to make sure that the water is being used in the proper way. For example, streams are tested to make sure that water quality standards are maintained; waste treatment methods are checked.

(f) answering complaints from the public about cases where the water laws are being broken, and collecting evidence for prosecutions.

## WHAT ELSE IS NEEDED?

The laws in the 1982 Water Resources Act are designed to protect the public through the careful management of water supplies. The Act should help to prevent people from using too much water, and from polluting the water.

Publicity is needed so that everyone knows about these laws. People should be able to recognise illegal uses of water. Many people will not be happy at having to pay for using water which may even run through their own land. Education and training programmes: may help people to understand why the laws are necessary.

There is pressure on Papua New Guinea to 'develop' its resources. This often involves using large amounts of water, and disposing of waste into the water. Water use and control of pollution should be considered as an important part of any project - not an unnecessary expense.

We should understand that water is just as important a resource in this country as our minerals and cash crops.