The Work of the Land Utilization Branch

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For any government wanting to increase the economic development of its country, the first question is, "What is there in the country that can be put to better use than it is now?" And this leads to other questions such as, "How much land is there that is suitable for cash crops? Which particular cash crops? Will one crop grow much better than others in this area?"

SO a vital task of the Department of Agriculture, Stock and Fisheries is to study the land to find the best use that can be made of it. It is not sufficient to study maps of the area (usually there aren't any!) nor even to fly over it and look at it from the air. Much more detailed work than that is required. Before a decision can be made on the most suitable crop for an area, the agronomists need to know what type of soil is present, if there are any deficiencies in the soil, something about the slope of the land, and of its rainfall. So when a Land Utilization Officer makes a map of an area, he does not merely note hills and valleys, rivers and swamps; he maps the types of soils in the area too, and this means taking many samples of the soil for analysis in Port Moresby later. When the area to be covered is several thousands of acres, the work may well last for some months or even years. It goes without saying that the areas concerned rarely have any roads at all; there is a good deal of footslogging in this work.

Detailed surveys of land use potential have been made before all the major agricultural development projects of the Territory have been started. These include the development of tea in the Western Highlands, cocoa in the Northern District and the Warangoi area of New Britain, and the oil palm project at Hoskins.

The work of the Land Utilization Branch is not limited to the work in the field. The field work is only the beginning. The work is followed through at Headquarters, on further technical and economic aspects by other branches.

The Branch serves as technical adviser to the Land Development Board, which is concerned with all agricultural development projects. Staff of the Branch assisted in the initial negotiations with the World Bank which subsequently led to the oil palm project by providing technical data, and by accompanying officials of the Bank to the proposed sites of development to give on-the-spot explanations of the soils involved in the scheme.

On the technical side, the Branch is an integral part of the Research and Surveys Division of D.A.S.F., and consequently works in close collaboration with the Chemistry Section, and with the agronomists who are concerned with the growing of the crops. The Branch quite frequently follows up the broad reconnaisance surveys conducted by the Land Research Section of CSIRO, and also interprets their findings for the policy makers on land development.

The more routine work involves the mapping of soils throughout the Territory, and their classification into categories for ultimate land use. Classification of the soils into families and series facilitates comparisons and contrasts of the different soils throughout the Territory. Information about the chemical and physical properties of the soil help in the crop yield predictions.

Mapping the distribution of the soils is most important so that any hazards can be avoided. Aerial photography is of great assistance in this work, but at times it is essential to have very detailed maps produced from intensive ground traverses.

The big task of the routine chemical analysis of all the soil samples brought in is carried out by the Chemistry Section, but the Land Utilization Branch has its own laboratory for research on physical properties of the soil.

The Soil Physics Section is studying the nature of clays, investigating the interaction of nutrients with the soil. It is known that in many cases, plants suffer from a deficiency of some nutrient, even though there is plenty of that nutrient in the soil; for some reason it cannot get out of the soil and into the plant. The reason may be that it reacts chemically with another nutrient, and the resulting new chemical compound becomes fixed on the surface of the clay particles. One well-known example of this is the interaction in acid soil of iron with phosphorus to form iron phosphate. Iron by itself is quite mobile, and so is phosphate; but together they anchor each other on the surface of the clay particles and are quite lost as far as the plant is concerned. Before a solution to these problems can be found, a full understanding is needed of the chemical reactions which are taking place.

A major part of the Soil Physics Section's work is concerned with soil microscopy. A great deal can be learnt by studying thin sections of the soil under the microscope.

These sections are not easy to make. Much patience, experience and good equipment are needed. A plastic resin is used to impregnate and harden the soil lump so that the components of the soil are fixed. Very thin sections are then cut (using special equipment) mounted on a glass slide and examined under the microscope.

When all the information has been collected, the results are compared with analyses from agricultural stations and plantations within the Territory and overseas. All the information is integrated to provide a good background picture of the land usage available.

Wahgi Valley Survey

The very thorough investigation which led to the present growing of tea in the Wahgi Valley gives a good example of the work of the Land Utilization Branch. Broad reconnaissance surveys made in 1955 to 1956 indicated that the soil was satisfactory, and that if the excess water could be drained off, a lot of good agricultural land would be available, thus accelerating the economic progress of the area.

In 1957 detailed survey work was started which took 3 years to complete. The team working on the task consisted of two professional officers, five technical assistants and many casual labourers from nearby villages. Although the total area covered was over 120,000 acres, the survey was a very intensive one. Of the land showing agricultural potential, the soil of every half acre was identified and mapped. Several hundred soil samples were taken, which were analysed by the Chemistry Section. In addition, all the plantations already established in the Wahgi Valley were mapped (for their soil types) and leaf and soil samples from these properties were analysed. Wherever it was possible to obtain accurate information by careful work, this was done.

Once it was known what soil types were involved, it was possible to lay down agronomic trials on the areas where the soil was typical of the whole valley. An experimental station was established at Olgaboli, and the crops tried were coffee, tea, various shade trees, and food crops. From this it appeared that tea would be most satisfactory for the area.

The work was then extended to the peripheral areas of the main swamp and this led to the establishment of the land settlement schemes at Kindeng and Avi. To date some 11,000 acres of the peripheral swamp area has been drained by the Branch. The officer-in-charge of this work has come from New South Wales where his main task was the conservation of water. Now he has to reverse his sights and concentrate on getting rid of water!

A new experimental station, the Kuk Tea Research Centre has been opened, and the work at Olgaboli is continuing with the Agronomist-in-Charge controlling the work of the two stations. Olgaboli is typical of the main swamp area, whereas Kuk, having swamp and undulating terrain, is more representative of the whole valley.

As a result of the Branch's work, and the subsequent work by the agronomists, tea production in the Wahgi Valley expanded rapidly. There are now 12 large tea estates established by private companies, and some 400 smallholders growing tea on land held either by Administration lease or by customary land tenure. Another 200 leases will soon be made available to smallholders. Three tea factories are now in operation, and a further two will be in production by the end of 1971.

Tea exported from the area during 1969 to 1970 amounted to 770 tons, and is commanding a good price on the world market. Production has exceeded the predictions made 10

years ago, although here, as everywhere, there is the problem of rising costs to be faced.

Following on from the work by departmental officers, a feasibility study of drainage of some 16,000 acres of swamp is now being undertaken by a leading firm of overseas consultants. Members of the firm include notable world authorities on drainage.

From this description of the work of the Land Utilization Branch it will be evident that a great deal of careful and painstaking research is carried out before any big agricultural project is undertaken. It may confidently be stated that few, if any, other developing countries have had the advantage of such a service preceding new agricultural projects.

Plate I.—Councillor Kuwok Bitan, Ministerial Member Tei Abal and Assistant Rural Development Officer Naphtali Kamare examine sheets of rubber from the smokehouse of the new processing factory at Magipopo in the Lake Murray area. Mr Tei Abal, Ministerial Member for Agriculture, Stock and Fisheries, officiated at a ceremony to open four rubber factories in the area

NEW RUBBER FACTORIES AT LAKE MURRAY

IN the past, the people of the Lake Murray area of the Western District of Papua have depended on the sale of crocodile skins for their cash income. Because of the serious drop in the numbers of crocodiles, this source of income is no longer adequate.

When the people asked the Administration for help in setting up a rubber industry, the Department of Agriculture, Stock and Fisheries staff provided seed, and practical help for planting. All the rubber is planted on individually owned blocks of land, and each block owner will eventually have 6 acres of rubber.

So far there are 81 acres of rubber at Buseki, 57 acres in Nago, 51 acres in Upovia and 56 acres in Magipopo. The project was financed by the Development Bank.

On Thursday, February 18th, 1971, Mr Tei Abal, Ministerial Member for Agriculture, officiated at a ceremony at Magipopo village to open the rubber processing factories of the four villages. Over 200 people attended the opening, and a demonstration of rubber processing was given by Mr Napthali Kanare, an Assistant Rural Development Officer.