

Consolidated interim Report
Economic survey Mission, Viêt-Nam.

List of Reports of Experts

<u>Experts</u>	<u>Interim Report on :</u>	<u>Pages</u>
1 Krug	Agriculture	1
2 Eijsvoogel	Land and water use	8
3 Kumar	Development of fodder and pasture	12
4 Gilbert	Forestry and soil utilization	16
5 von Monroy	Forestry and forest industries	25
6 Robinson	Industry	28
7 Schwob	Mineral resources	31
8 Tan	Drainage and irrigation	35
9 van der Noord	Inland waterways and inland waterway transport	37
10 Kavila	Highways	39
11 Johnston and Amoss	Manpower and refugee settlement	45
12 Rosebery	Financial policies	49
13 Lacroix	Statistics	57
14 Miles	Pêches	66
		~102

UNITED NATIONS
ECONOMIC SURVEY MISSION TO VIET-NAM

Interim Report by C.A.Krug

on

AGRICULTURE

I - INTRODUCTION

According to the terms of my appointment, my assignment is "to collaborate in the work of the Mission, in particular, on the agronomic and management aspects of crop production with a view to (a) increasing production of existing crops; (b) introducing new crops; (c) improving the conservation, storage and processing of agricultural products." Later I also was asked to serve as a liaison officer for all matters concerning F.A.O. responsibilities, as well as to make suggestions regarding the 1956 Technical Assistance Programme in agriculture for Viet-Nam.

II - PROGRAMME FOR AGRICULTURE OF THE "DIRECTION DU PLAN"

The Viet-Nam Government, conscious of the seriousness of the present economic situation and convinced of the overwhelming importance of agriculture for its present and future economy, has recently prepared a "Plan de Development agricole". Its aims may be summarised as follows : (a) increase and diversify agricultural production to satisfy internal demands, reduce imports as well as expand exports; (b) improve living standards of rural and urban populations; (c) produce raw material for expanded industrial activities; (d) contribute to settle refugees from the north. Higher per ha yields and diversification of agriculture are also sought for and through land reform it is hoped to settle main social problems in rural areas. The "Plan" also includes the regaining of extensive abandoned rice areas, specially in the Mekong delta, the utilization of new areas and the fostering of various cropplants, some already cultivated in the country, others to be introduced. Reference is also made to animal husbandry and sericulture, as well as to fisheries and forestry and also to problems related to sound credit and to cooperatives, essential to stimulate production.

The programme is, as a whole, well laid out and also establishes priorities for several items, as the rapid regaining of abandoned land and the development of secondary activities, such as animal husbandry and sericulture. Special urgency is also required for the better

utilization of the high plateau areas (PMS) and of the Camau region and the "Plaine de Jones".

In the final report it is the Mission's intention to give its final point of view on this "plan" in its various aspects, specially, in relation to the established priorities, which might require some modification. Some other items, not mentioned in the "Plan", also ought to be included.

III - GENERAL PROBLEMS

3.1 - Agricultural research, teaching and extension and urgent need for its reorganization and expansion

It would be of no use to work out an elaborate plan of agricultural development, if the official organizations lack an adequate structure and without a minimum number of scientific and technical workers to carry out the required laboratory and field experiments and the necessary extension work.

Government agencies in Viet-Nam have suffered numerous changes in the last years. Some institutions have been closed or transferred to other Government Departments and new ones have been established, some duplication having arisen, which, by all means, should be avoided, due to the extreme lack of specialised workers. The general situation is being analysed and a basic recommendation will be included in the final report, suggesting the establishment of a simple and efficient type of Government Organization in charge of agricultural research, teaching and extension. Of primary importance and urgency is the organization of a few, well located and well equipped regional and agricultural Experiment Stations.

3.2 General problems in rice areas

Tradition and routine are deeply rooted in Viet-Nam rice areas. Therefore, any profound modification to promote a more rational agricultural production scheme there, will require patient work during a long period of time. A few hundred varieties of rice are grown; no rotation is practiced and chemical fertilizers applied to a very limited extent; practically no areas for pasture exist on rice farms; wood for fuel is badly lacking; only a few other crops are found around the farm houses; animal production, with the exception of fish in rivers and ponds, is almost entirely absent or reduced to a limited amount of porc and poultry. A programme with the view of introducing a better balanced agricultural production should therefore include among other items:

- a) the production and multiplication of a limited number of rice varieties, well tested in each area, a start having already been accomplished in this direction;
- b) The use of more fertilizers, both organic and chemical;
- c) The introduction of new crops, leguminous (soja, peanuts, etc.) and fiber plants (jute, roselle, etc.) to rotate with rice;

- d) The expansion of intensive animal production, a minimum area of pasture being provided on each farm ;
- e) The use of more land, on each farm, for other crop-plants for home consumption (maize, sugarcane, sweet-potatoes and fruit trees) and also for some fuel production (Albizia sp.)
- f) The establishment of small fish ponds for Talipia production, as recommended by USOM.

farms

Small model/should be established in the rice areas, along the main roads to demonstrate to farmers the advantages of the proposed scheme.

3.3 - Irrigation and Drainage

Large amounts of money have been spent in the past with the establishment of a vast system of canals in the southern, as well as in the eastern rice areas. Much has been damaged by the war and a general reconstruction plan has to be put into operation to control floods and to promote the necessary drainage of immense areas.

3.4 - Expanded utilization of the "Plateaux Montagnards Sud"

The "PMS" represents a vast mountainous area extending through the center of northern South Viet-Nam. Large areas of red soil varying altitudes and special climatic conditions make it suitable for a variety of crop plants of special importance to Viet-Nam economy, as rubber, coffee, tea, vegetables, etc., various others having been grown there with success.

A special scheme will be prepared for the establishment there for refugees, possibly south of BanMeThuot. Each family shall dispose of a small area for special food production, the rest of the area of each farm being devoted to a) reforestation for fuel production and timber ; b) perennial crops, as coffee or tea, etc. and c) for pasture in rotation with annual crops, as proposed by M. Gilbert.

3.5 - Utilization of the "Plaine de Joncs"

This is^a large area of lowland, northwest of Saigon. Its soils are to a large extent toxic, due to the periodic accumulation of aluminum sulphate in its top layers. Due to the complexity of this problem and to the fact that large amounts of capital would be required for convenient drainage and irrigation, it is suggested that this project should only be considered in a distant future.

3.6 - Mechanization

Hand labor is, along with animal traction

(buffaloes) the only source of power on Viet-Nam Farms. Except in certain areas, there is no labor shortage for the maintenance of present agricultural production, the refugees from the north having added considerable amount of man power. There is therefore an enormous open field for farm mechanization in this country, but this problem should be considered with great caution. Practically all machines would have to be imported, a handicap, if one considers Viet-Nam's present very limited external purchasing power. Mechanization would also reduce hand labor in rural areas, the surplus being obliged to migrate to villages and large cities, where a well planned industrialization scheme should then be worked out in advance to take care of this hand labor. At present, perhaps mechanization should only be carried out in the large plain areas, where rice growing was abandoned for several years due to war and insecurity. To speed up rice production in these areas, mechanization could play an important role, as there is a great lack of buffaloes (estimated deficit of about 100.000)

3.7 - Credit, Cooperatives and Land Reform

These subjects will be dealt with in the reports of other Mission members. Their importance for fostering agricultural development cannot be overemphasized and this is duly recognized by Government Officials.

IV - PLANT PRODUCTION

In the following chapters the situation and outlook of some of the crop plants grown in Viet-Nam will be analysed.

4.1 - Rice

At present, a considerable world surplus of rice is available. In consequence, prices on the international markets are rather low. Viet-Nam suffered a drastic reduction in its rice production, specially due to the abandonment, during the last years, of about 730.000 ha. Compared with the 1942/43 production of over three million tons, the 1954 was down to 1.975.840 tons, the present year's total yield being estimated to be somewhat better. From a main rice exporting country, Viet-Nam is now scarcely producing for its own normal consumption. In order to supply internal needs of its growing population - recently added by some 800.000 refugees from the north - and to recover its position as an exporting country, Viet-Nam must again expand its rice production. No doubt, soil and climatic factors favor this expansion, but cost of production must be kept at a low level. This can only be achieved by increasing per ha yields through better varieties, fertilizing the soil and better irrigation and drainage. Better transport, milling and storage facilities as well as reducing intermediaries also contribute substantially for reducing cost of final product.

Increase of per ha yield - now at about 1.3 tons - will be a rather slow process, but a practical programme in this direction should be immediately started. This should include a change in the present breeding programme : more emphasis must be laid on regional variety testing and improvement of the best by mass and pedigree selection, than on breeding by hybridisation. Simple fertilizer tests should be carried out on a much larger scale in order to indicate the best fertilizers for each region. Crop rotation and green manure experiments should also be conducted. An expanded programme for improving irrigation and drainage systems would also be of basic importance.

Most of the milling facilities are in the hands of big trade firms and exporters in the Saigon-Cholon areas. As the present Government policy is to increase the producer's income, a good deal of the milling is to be transferred to the producing areas and controlled by cooperative organizations. Modern equipment, such as already exists at some places, should then be made available in sufficient quantity in order to improve the quality of the product.

4.2 - Rubber

Rubber production comes second to rice in economic importance to Viet-Nam. It is mostly in the hands of large Companies, occupying an area of some 108.000 ha, only a little more than half of it being at present exploited. Total production is somewhat over 50.000 tons, the majority of which is exported to USA and to France. Internal consumption is of the order of about 1.000 tons.

It is well known that the survival of the natural rubber industry depends on the quality of the product and its cost of production in relation to synthetic rubber. Therefore, all natural rubber producing countries must produce the best quality rubber at the lowest possible price. On the other hand, consuming countries are constantly increasing imports and it is estimated (US Paley Commission) that by 1975 total rubber absorption outside the Iron Curtain will be around 5 million tons.

South Viet-Nam offers excellent soil and climatic conditions, especially at the "Bas Dony" and PMS" areas for rubber production. The most important problem facing this industry is, however, the replanting of old plantations by new ones of high yielding clones. This problem, apparently, has not been taken into consideration as it should have been, mainly due to the long war period which affected the local industry very badly. It is urgently required that a long term replanting programme be immediately put into action, possibly to be financed by the establishment of a replanting fund, to be financed by a tax on exported and home consumed rubber.

4.3 - Tea

Tea cultivation occupies an area of over 18.000 ha, less than one sixth of which is in the hands of large plantations; the remnant is composed of small holders. Soil and climatic conditions are favorable in the Biao and Djiring areas; in Pleiku the "Catecka" Company is irrigating part of its plantations, due to the long period of dry weather (5 to 6 months). Here also the most modern methods of cultivation are observed, such as contour planting in double or triple rows and heavy fertilizing. Processing methods at this plantation are also up-to-date.

To increase per ha production and to improve quality in small holdings, an extensive programme of field experiments and demonstration plots should be carried out and cooperatives organised to improve processing and reduce the cost of final product.

It seems doubtful whether an expansion of tea cultivation should be recommended much beyond home consumption levels, as to compete in world markets, quality must be very high and cost of production as low as possible.

4.4 - Coffee

Coffee does not represent a major product in Viet-Nam economy. Local production is entirely consumed in the country, which also occasionally imports it from abroad.

Due to the leaf disease (*Hamileia vastatrix*) and a stem borer, *C. arabica* plantations had to be almost entirely abandoned. They are being replaced by Robusta coffee (*C. canephora*) and by Chari (*C. excelsa*) which are more resistant. The "Cie. Haut Plateaux Indochine" (CHPI) maintains 534 ha with coffee, of which 415 ha of Robusta and the rest of Chari. The average yield of 2,200 kg/ha is excellent and due to most modern methods of cultivation. Processing is also done by-to-date methods, only the fermentation period could be reduced by using "Benefax" (Standard Brands). The quality of the product is good, however much inferior to the arabica coffee.

With reference to small holders, the same applies that was said for the tea planters: they have to improve methods of planting, cultivation and picking, as well as processing, the establishment of cooperatives being here also recommended.

The expansion of coffee production beyond local consumption levels is of doubtful value as, most probably, the world market will, in a very near future, face again the problem of a marked overproduction, usually disastrous to prices.

4.5 - Other Crops

South Viet-Nam offers excellent ecological conditions for the economic exploitation of a number of other crop plants. Coconut production could be expanded by the carrying out of an extensive fertilizer programme. Tobacco has also possibilities for considerable expansion with the view of reducing imports, the local industries being able to absorb large quantities, if production prices and quality are satisfactory. The sugarcane area can be enlarged and per ha yields increased by introducing better varieties and improving production methods; at least one new factory (sugarmill) should be established to reduce or even avoid import of sugar. Maize should be cultivated to a much larger extent in all agricultural areas, the first step being the testing of new varieties, to be introduced from other tropical countries. Cotton, no doubt, has excellent opportunities, but its cultivation should only be recommended after the selection of well suited areas and of the best varieties for each region. This problem is rather urgent, as the import of textiles is among the heaviest. Many oil and fiber plants, as peanuts, sesame, castorbeans and jute, ramie and hibiscus, etc...as well as fruit trees and vegetables can be grown in various areas and would contribute substantially to the diversification of South Viet-Nam's agricultural economy, to improve human diets, to encourage local industries and to develop new export possibilities.

UNITED NATIONS ECONOMIC SURVEY MISSION TO VIET-NAM
INTERIM REPORT BY W.F. EIJSVOOGEL
ON LAND AND WATER USE

CONTACTS

Being assigned to cover the subject "Land and Water Use", I had to make contacts with the Department of Agriculture as well as with the Department of Public Works.

With Mr. Krug I called upon the Secretary-General of Agriculture, Mr. Châu-Tâm. He gave us an outline of the problems confronting his Service, of which perhaps the most serious is the lack of trained personnel. Thereafter he introduced us to the different chiefs of section. As I am only interested in the soil and in the hydraulic problems, I visited only the "Service du Sol" and the "Service du Génie Rural".

SERVICE DU SOL

This service consists at this moment only of a laboratory in which routine analyses are made of soil and other materials if these are presented to it. Fundamental research is evidently stopped because of lack of personnel. This is to be deplored because in the Report about the activities of the department for the year 1953-1954 interesting experiments are mentioned for reclaiming so-called "Sol aluné" (soil containing toxic quantities of free aluminum, which soil is frequently found in the Mekong delta). These experiments, however, seem to have been discontinued; we were told that the results had not been encouraging.

SERVICE DU GENIE RURAL

This service concerns itself with "Hydraulique agricole" (local drainage and irrigation projects of minor importance), with "Constructions rurales" and with "Machinisme agricole". The Director being in Europe, we were received by his deputy who is actually in charge of the mechanical sub-section. He could not tell us much about the drainage projects but, on the other hand, gave us useful information about his efforts to replace the inefficient "noria" either by a more modern water-wheel (which looked very attractive) or - with co-operation of the American Aid - by small centrifugal pumps driven by gasoline motors.

It may be the place here to mention that this last proposition was discussed thoroughly with Mr. Cox, the irrigation specialist of USOM, when I visited this agency a few days later. Mr. Cox thinks that the first practical approach to irrigation by pumping (which is in many cases the only possible solution in such a flat country as the Mekong delta) is to teach the farmers to operate a small pumping unit and to use - especially to sub-divide - the water acquired. A small co-operative of a small number of farmers, the land of whom forms more or less a topographical unit, is the evident solution here. So he urged the "Service du Génie Rural" to form such co-operatives. I fully agree with him that communal action in the field of irrigation is absolutely necessary in tropical countries where the average number of acres of a farm is usually very low. It is to be hoped that such "pilot co-operatives" may be formed soon in all the provinces.

My visit to the Department of Public Works was made together with Messrs. Tan and Van der Oord. We called upon the Director-General, Mr. Nguyen-Van-Dinh, and afterwards visited the Bureau of the Irrigation and Drainage Section where we met several engineers. Although also in this department the lack of trained personnel is severely felt, it was refreshing to see the keen interest which these engineers took in their task and to hear about the practical solution they stood for.

The Irrigation and Drainage Section aims for the near future only at two things : the rehabilitation of the existing sluices and canals in South Viet-Nam and the extension of irrigation facilities in the coastal area of Central Viet-Nam. About this last problem, I can give no opinion because Mr. Krug's and my visit to this area is planned in January. The rehabilitation of the drainage-works in South Viet-Nam, however, must be considered as of primary importance. I draw this conclusion from the literature and it was confirmed during a visit made to the area which will be described later.

When the rainy season is nearing its end and at the same time the over-flow water from the Mekong floods has disappeared, salt sea water penetrates into the delta. For the most part this occurs along the waterways : little rivers, abandoned river arms, and of course the numerous canals which have been dug for navigation and drainage purposes. Between 1920 and 1940 a number of these canals have been closed by automatic sluices, which open at low tide and close at high tide. These sluices - and especially their metal gates - are severely damaged by lack of maintenance. Some of them are already repaired, others will be renewed in the coming year. Because the capacity of the bigger canals to carry salt inland is far greater than that of small and shallow rivers, this work should be speeded up as much as possible and where the sluices are lacking, new ones should be built.

Mr. Krug and I visited also the Meteorological Institute, where we were received by the Director-General. He told us that from the period before the war a few valuable publications exist about the climate of Viet-Nam, but that during the war especially after the Japanese occupation and the unrest that followed afterwards, the operation of many of the gauging stations was discontinued. Since last year his Institute has been trying to put the most important of the stations in working order again and a **publication will be issued within a few months on the few stations where observations could be continued.**

TRAVEL WITHIN THE COUNTRY

There were two occasions to study the Mekong delta area. The first was a trip to Cantho organized for the Mission as a whole. The trip was made by car, passing the towns of Tanan, Mytho and Ving Long. Various establishments were visited. From the point of view of Land and Water use it is important to note that at that date (first days of December) very different stages of growth were seen in the paddy fields. While in some fields harvest was going on or already finished, the farmers were transplanting in other fields. The general outlook of the crop was good, but this irregularity in planting habits must make it very difficult to introduce so-called second crops. These need a far more intensive drainage than rice and so there will always be difficulties between the farmers which still have rice on their fields and those who want their fields dry.

The second trip was a visit to the area east of Soctrang, organized by the Department of Public Works. Mr. Krug, Mr. Tan and I participated in it. We started by flying in the early morning from Saigon to Soctrang, which gave us the opportunity to see from the air the area between the branches of the Mekong. This area has for long years been under cultivation, and is very densely populated. Every hectare was evidently occupied by rice fields or coconut groves. The tendency to leave the less fertile part of the land fallow (about which there has been much talk) is found presumably only in the new areas (Trans-Bassac and the fringe of the Plaine des Joncs).

We visited by canoe and jeep two sluices where the old gates were being replaced by new ones. This brought us to the area along the coast where the paddy gives high yields but where the salt danger is always lurking in the background. We thought the stand of the paddy very good and we were told that this was presumably partly because the canals had been closed by earth dams early this fall in order that the sluices might be repaired.

A third trip was made to the so-called "Hauts Plateaux", the plateaux in the mountainous part of Viet-Nam that are of volcanic origin and are covered by red basaltic soils. Mr. Krug, Mr. Gilbert, Mr. Kumer, Mr. Robinson and I participated in it.

We went the first day by car to Dalat, passing two interesting areas: "Le Bas Donnai" and "le Haut Donnai". In both areas refugees are settled. Especially the lower area seems attractive, having a good soil and favourable communication possibilities with Saigon. Studies should be made of possible irrigation from the Donnai river. Up till now the refugees are settled mainly along the roads, where also several estates are found and where the available acreage is limited. Presumably along the river there is to be found land just as fertile and even more attractive because of the possibility of irrigation.

The high Donnai plateau is also already partly taken up by estates. The refugee settlement, which up till now is limited, has the advantage of the possibility of earning wages on these estates. However, when more refugees are settled here, the fairly steep hillsides will soon prove themselves very susceptible to erosion and a thorough farming plan will be of the utmost importance for these new settlements.

The second day, we went from Dalat to Ban Me Thuot, passing through the mountainous country between the Haut Donnai and the Darlac plateaux. This gave us the opportunity to see something of the disastrous effect of the shifting agriculture of the indigenous Moi population, who cut down the forest on steep hillsides where no possibility of reforestation exists.

The third day, we visited the Darlac area. The plateau here is for the most part flat; danger of erosion does not exist. There are possibilities here for the settlement of a considerable number of refugees. One should, however, keep in mind that the first thing to do is to try to settle the Moi population. In this area, there is practically no virgin forest left, the shifting agriculture is slowly killing the land. With a good farming scheme and especially with introduction of cattle this area offers ample opportunity for settlement. I was asked to visit the so-called Lac area, a valley situated south of the plateau, where fertile alluvial soil is found

but where, as in many cases in mountain areas, agriculture is hampered by torrential floods and drainage difficulties. It seems to me that where there are so many hectares of good land available on the plateau, spending money - and presumably a very considerable amount of money - to improve drainage conditions in this plain has not much sense. However, for future use, hydraulic studies should be started as soon as personnel is available.

The last two of the trip were spent on the plateau of Pleiku. From the point of view of land use there is not much to say about the situation there. The soil is evidently much poorer than on the Darlac plateau, vegetation is for the greater part grass and shrub, the climate is harsh with a long dry spell in winter. The lower area along the river, which crosses the plateau, is for the most part in use as irrigated rice fields, cultivated by Vietnamese immigrants from the coast. There are two tea-estates one of which was visited. A remarkable thing is that the tea plants are irrigated during the dry period; they seemed to stand this treatment - unusual for tea - very well.

(I) there

UNITED NATIONS ECONOMIC SURVEY MISSION TO VIET-NAM

REPORT BY L.S.S. KUMAR

ON DEVELOPMENT OF FODDER AND PASTURE

Background Information

The development of pasture and fodder resources of a country has to be considered in relation to the development of its livestock and its climatic factors. In the overall economic development of Viet-Nam the need for its livestock development is quite obvious and the consideration of this matter will appropriately be dealt with in a separate place in this report. In respect of the climatic and ecological factors with particular reference to grasslands, the Republic of Viet-Nam is naturally divisible into four distinct regions, each of which is still further subdivisible if soil and other factors are taken into consideration. The natural regions are :

- (1) the highlands or the mountainous regions of the north;
- (2) the midlands or the plateau region;
- (3) the lowlands of the centre and the south; and
- (4) the coastal region.

Each of these is characterised by distinctly separate composition and climaxes of vegetation.

Among the four regions the most important from the point of view of pasture or grassland development, the midlands or the plateau regions, offer the greatest possibilities. These regions which lie at altitudes from 200 to 600 metres comprise extensive savannah and savannah-steppe areas occupied by tall, very coarse and less palatable grass much of which goes to waste, except for the admirable purpose it serves of acting as soil cover to protect the underlying soil from denudation and erosion.

Next in importance come the moderately dense woods, the undergrowth of which consists for the present of the coarse tall grass and a mixture of useless scrub. At higher altitudes the less dense pine forest, situated on moderately sloping and nearly flat lands, provides rough grazing composed of coarse grass.

The areas abandoned by shifting cultivation have been overrun by the compositaceous weed Eupatorium odoratum and a very coarse but hardy grass known as tranh grass (Imperata cylindrica). Although both these are troublesome weeds from the point of view of cultivation and very aggressive, they quickly multiply and cover any open or unoccupied area. However much of a nuisance they may be but for these weeds the area abandoned from cultivation would have been exposed to the ravages of monsoon and caused considerable loss from soil erosion.

The flatter areas on either banks of rivers and mountain streams support vegetation which remains green for a much longer period compared to the forage of the plateau region which becomes completely dry due to the setting in of the drought or dry period earlier.

The lowlands are mostly utilized for rice cultivation and only such of those areas as are unfit for cultivation of rice or any other crops may provide some scope for growing of fodder and forage crops to a limited extent.

Cattle Type and Quality

The present cattle in the country are a heterogenous non-descript breed of extremely poor quality. They are very stunted in growth and serve the needs of the farmer which for the time being are too few and simple. The cattle are used for draught and for meat. Milk production is not practiced as drinking or use of milk in any form is not known.

Grazing Practice

The cattle of a village graze in herds in the unlimited savannah and steppe grasslands that adjoin the villages. There is no organized method of grazing as there is no immediate need for it, the number of cattle being quite limited and rough grazing available unlimited.

Hay Production

In the rice belt, the rice straw is cut and stacked to provide dry fodder for the hot and rainy weather. The rice stubbles left in the fields are grazed by the water buffaloes until the time the fields are required to be prepared for the next sowing.

In plateau region the dry, coarse grass provides fodder of inferior quality. Since this grass is allowed to grow very tall and become fibrous it is presumable that its importance as hay, if cut young and stored, is not known.

Fodder Production

There is no practice of growing fodder crops on a large scale to provide feed for livestock. It is always the refuse from crops that are fed to cattle. Maize is grown to a very little extent and that too for human consumption. Rice bran is used for poultry and pigs. It is interesting to note, however, that the water buffalo which feeds entirely on reeds, and weeds that grow in water and the grass that grows on ridges around rice fields, on road sides and other waste lands, is so sturdy and strong. In comparison with the water buffalo the cattle which feed on similar material are stunted in growth and are of extremely poor quality. This definitely points to the fact that cattle need more nutritive forage than the present coarse types now available.

Development of Grazing and Fodder Production

In all underdeveloped countries there is a belief that grass as fodder requires little or no attention as nature in her bounty has provided grass everywhere and all that remains to be done is to make use of it. It is necessary to remove such a misconception and educate people at all levels to the fact that grasses differ as much in quality and importance as do crop plants such as rice or maize. In all occidental countries considerable importance is given to production of the best forage which is reflected in the high quality of their cattle and their high milking capacity.

The development of grazing areas and production of feed crops have to be undertaken pari passu with the development of livestock. Attention paid to one and the neglect of the other will result in a lopsided development.

In this country grassland development and fodder crop cultivation have to start from scratch as there is no work done on these in the past. Grassland development is a long-range problem and no spectacular results can be expected within a few years specially because of the very poor fertility level of the soils of most of the natural grazing areas of the savannah and the steppes and because of the infestation by weeds which will be difficult to eradicate and keep in check.

Regional Stations

Modern techniques have to be adopted in the development of grasslands such as improving the soil, introduction and acclimatization of superior types of grasses, legumes and fodder crops, and selection within the indigenous grasses and

legumes of better types. The work along these lines will have to be adapted to suit the needs of each region because of their difference in climatic and edaphic factors. This means the establishing of regional stations where work on breeding of livestock, forage grasses and legumes and feed-crops could be undertaken. Some part of the work of these regional stations will have to be conducted, especially of chemical nature, such as analysis of feeds and fodders, at a central laboratory. The Vietnamese Government has provided for one such central laboratory in Saigon which needs to be fully equipped. The area around Ben Cat which is about 55 kilometers from Saigon offers very good possibilities for establishment of a dairy and livestock breeding farm as both the climate and the soil are ideally suited for this purpose.

Each regional station should be provided with about 2,000 acres of undeveloped land which could be developed over a number of years as the need for more land arises with the development of the work. It is needless to point out that adequate staff and funds should be provided to plan and execute work at each station that would be capable of future extension in the region.

Technical Assistance

One of the biggest disadvantages in undertaking pasture and fodder work is the lack of well trained technical personnel. It is recommended that the Vietnamese Government should recruit persons with basic training in science and these should be provided with special training in agriculture and livestock development on modern lines. The Government of Viet-Nam may approach the Food and Agriculture Organization of the United Nations and the Colombo Plan Authorities to award fellowships to enable sending abroad of selected candidates for specialized training in grassland and forage work.

Technical Advice

The Government of Viet-Nam should approach the FAO to provide help of advisers to organize and develop work on grasslands and fodder crop production for a few years in the beginning until trained Vietnamese personnel can undertake the work on their own.

MISSION D'ETUDES ECONOMIQUES DES NATIONS UNIES
DANS LA REPUBLIQUE DU VIET-NAM

R A P P O R T

PROVISOIRE DE GEORGES GILBERT
SUR LES QUESTIONS FORESTIERES ET L'UTILISATION DU SOL

P L A N

I.- Les Forêts du Sud Vietnam

- A/- Distribution - Zones excédentaires, Zones déficitaires.
- B/- Composition des forêts - Inventaire forestier.
- C/- Administration; Gestion; Recherches.

II.- Influences anthropiques sur les groupements forestiers et le sol.

- A/- L'exploitation forestière;
- B/- Les cultures: cultures industrielles, ravs.
- C/- Les feux.

III.- Possibilités de maintenir et d'améliorer le potentiel forestier; Utilisation des terres, Conservation des sols.

- A/- Diminution de l'effet destructeur des cultures industrielles, ravs et feux sauvages. Implantation des réfugiés.
- B/- Comportement des peuplements forestiers :
 - 1) sans exploitation;
 - 2) après exploitation;
- C/- Reboisement :
 - 1) en zones forestières;
 - 2) en régions déboisées;
 - 3) Essences exotiques;
 - 4) Plasticité et adaptabilité des espèces.
 - 5) Ennemis et maladies.

IV.- Utilisation du bois.

- A/- Détermination des espèces importantes;
- B/- Possibilités de substitution;
- C/- Non valeurs.

W W

...../

I.- LA FORÊT AU VIETNAM.

(A considérer en fin de Mission)

II.- INFLUENCES ANTHROPIQUES SUR LES GROUPEMENTS FORESTIERS ET LE SOL.

A.- L'exploitation forestière.

- 1/ en forêt protégée;
- 2/ en forêt classée.

(Visites diverses en Janvier-Février).

B.- Les cultures industrielles; les rays.

Le rapide déplacement SAIGON - DALAT - BANMETHUOT - PLEIKU nous a permis de constater :

1) Que dans les régions accidentées les cultures de plantes industrielles (thé-café) peuvent être une cause d'érosion si les techniques culturales ne sont pas respectées. Plantations de thé de la région de Blao à plantes presque complètement déracinées attestant l'enlèvement d'une couche arable de 20-30cm d'épaisseur;

2) Que la pratique des rays :

- a/ a une répercussion sur la végétation forestière et le capital forestier en substituant des groupements de moindre valeur; favorise indirectement les feux de brousse;
- b/ a un effet destructeur inégal suivant les modalités d'application: rays communs ou rays familiaux;
- c/ est une cause profonde d'érosion principalement dans les régions à terres non basaltiques;
- d/ ne favorisent le ruissellement peut avoir une influence défavorable quant à l'afflux des eaux sur les terres et rizières situées en contre bas.

... /

N.B.-L'attribution de terres de culture non délimitées aux villages de réfugiés est une cause supplémentaire de destruction de forêt et de dégradation du sol.

...../

C.- Les feux de brousse.

Les feux parcourent soit annuellement soit à des périodicités moins régulières les steppes, ravenes et forêts claires en :

- 1/ freinant le retour d'une végétation liqueuse malgré la vocation des terres;
- 2/ en entamant les groupements forestiers parcourus avec comme résultat un appauvrissement graduel, ces groupements appauvris favorisent la dégradation du sol (Pleiku).

III.- POSSIBILITES DE MAINTENIR ET D'AUGMENTER LE POTENTIEL FORESTIER; UTILISATION DES TERRES, CONSERVATION DES SOLS.

A.- Limitation de l'effet destructeur des cultures de plantes industrielles, des rays, des feux de brousse.

1/ Les cultures industrielles :

limiter les grandes cultures économiques aux surfaces non ou peu accidentées :

- 1°/ en respectant les règles élémentaires : contour planting;
- 2°/ en créant des haies antiérosives;
- 3°/ en maintenant et en améliorant les conditions physiques du sol.

2/ Les rays :

Certains programmes prévoient le regroupement de montagnards dans les zones permettant une agriculture continue. La réalisation de ce programme entraînerait une modification profonde du mode d'existence d'un peuple indépendant; de plus le dépeuplement de certaines zones pourrait avoir des répercussions économiques défavorables : exploitation forestière, entretien des routes, etc... L'implantation de réfugiés s'adonnant à la culture du riz irrigué pourrait être un exemple qui serait vraisemblablement suivi par certains montagnards.

Afin d'atténuer les effets néfastes de l'agriculture des montagnards :

1°/ Ordonner et aménager les rays.-Les rays familiaux ou communs peuvent être cantonnés sur des terres appropriées et soumis soit à une rotation, comprenant une jachère forestière (naturelle ou dirigée) ou une jachère paturée suivant le cas, soit à un système syloo-agricole permettant l'enrichissement de certains cantons en essences économiques (les pins par exemple). L'organisation de l'agriculture en pays de montagne est le seul moyen d'évolution;

2°/ Intégrer les rays

...../

2°/ Lutter contre l'érosion : haies antiérosives, aménagement de terrasses;

3°/ Adopter une rotation convenable. Ce principe permettrait de tirer un plus grand profit de la terre tout en s'opposant à sa dégradation. L'introduction dans la rotation de plantes sèches en protéine sont indiquées (arachides, par exemple);

4°/ Valoriser le travail agricole en introduisant une plante d'exportation dans la rotation :

- a) le Vietnam importe des quantités appréciables de sacs de jute (1953: 3428 Tonnes pour une valeur de 28.247.000 piastres; 1954 : 6.127 Tonnes représentant 56.696.000 de piastres. Dans la région de Banmêthuôt nous avons trouvé en maints endroits l'URENA LOBATA qui fournit une fibre appréciée, il serait possible d'introduire cette plante en tête de rotation, tout en assurant au planteur un revenu appréciable elle contribuerait à diminuer les importations. Nous avons conseillé à Monsieur LUONG, agronome de la Zone de Banmêthuôt de récolter des graines de cette plante en vue d'en étudier le comportement. Dans le même ordre d'idées nous avons vu des Agaves bien venantes dans la région de Pleiku.
- b) les importations de coton sont aussi importantes, certaines variétés de cotonniers pourraient trouver place dans la rotation.
- c) L'arachide peut être intéressante pour d'autres régions. La Création de stations locales pour la mise au point des méthodes culturales, de méthodes conservatrices pour le sol, l'étude comparée des espèces et variétés, etc... rendrait de sérieux services.

3/- Les feux sauvages :

- a/ faire respecter les ordonnances;
- b/ essayer les feux hatifs dans certaines forêts claires. Cette méthode a donné d'excellents résultats dans certaines régions et une augmentation remarquable du même;
- c/ cloisonnements avec cordons pare-feux dans les Zones agricoles ou cantonnements forestiers intéressants.

N.B.- L'implantation de réfugiés. (p. a et b. qui figurent à la fin).

B.- COMPORTEMENT DES PEUPELEMENTS FORESTIERS.

(Observations sur l'évolution des peuplements et les possibilités d'intervention).

...../

C.- Reboisement

I.- En zones forestières

Visite de la Station expérimentale de Trang-Boun
le 17 Décembre . Les essais conformément :

- a) Reboisement en essences pures et mélangées;
- b) Méthodes de reboisement:
 - 1.- Uniquement en essence principales;
 - 2.- Emploi d'une essence intermédiaire;
 - 3.- Emploi d'une essence de première installation accompagnée d'une essence intermédiaire.
- c) Ecartement à adopter :
 - 1.- Pour les reboisements en essences pures;
 - 2.- Pour les essences intermédiaires.
- d) Influence de l'éclaircie
- e) Influence de la litière morte sur le sol.

Des expériences en cours il résulte :

- 1.- Possibilité de substituer à un peuplement hétérogène un peuplement riche d'espèces plus intéressantes;
- 2.- La litière de certaines essences acidifie le sol:
 - a) en SAO (HOPEA ODORATA) et le DAU (DIPTEROCARPUS) ne sont pas à éduquer un peuplement pur mais un mélange avec des légumineuses aptes à maintenir les qualités de la litière;
 - b) pour le Muong (Cassia dianna) ce défaut s'ajoute à d'autres (cp 5°, 6°).
- 3.- Les espèces de première installation ont une action favorable sur le développement des essences principales.

D'après certains essais en cours la préférence doit être donnée à Acacia Aneura. L'essai comparatif avec Chlorofloca exerça comme essence principale est remarquable à cet égard : les plants avec Acacia Aneura comme intercalaire sont plus développés, plus robustes que ceux dans l'intermédiaire INDIGOFBRA TESSHANNH; le système racinaire superficielle et très développé de cette dernière espèce pourrait expliquer la différence de développement.

...../.....

- 4.- la florule des jeunes parcelles établie avec intercalaire ACACIA ou INDIGOFERA se compose presque en totalité de graminées, telles que Melirnis, Paspalum et pourraient revenir de paturage transitoire.
- 5.- L'écartement adopté pour l'essence intermédiaire, le Cassia dianna dans la plupart des cas, a une influence marquée sur le développement des essences principales. L'objet écartement DACBERCIA COCHINCHINENSIS et CASSIA SIANEA datant de 1935 est remarquable : les Cassia mesurent \neq 14 m de haut, le dalbergia à l'écartement de 2 m mesure \neq 6m, tandis que dans l'entre -ligne de 6m ils mesurent 12 - 13m de haut.
- 6.- L'emploi du Muong (Cassia Sianea) comme essence intermédiaire doit être examiné. Dans les terres rouges basaltiques et planté à large écartement il ne semble exercée aucune influence déprimante (plantation de caféiers Robuste à Banméthuôt); par contre dans les terres argiloricieuses, comme à Trang Boun, quoique favorissant la création rapide de l'état de massif dans le jeune âge, il y a lieu de l'éliminer progressivement du peuplement vers l'âge de 5, 8 ans (voir 2°, 5°).
- 7.- L'éclaircie, intervention culturale souvent couteuse, est nécessaire : Suivant la situation l'enlèvement de l'essence intermédiaire peut payer une partie des frais d'installation, par contre l'intervention dans les jeunes peuplements plantés d'une seule essence peut être déficitaire.

II.- En régions déboisées.-

(à voir)

III.- Les essences exotiques.-

Parmi les espèces exotiques qui pourraient être éventuellement pris en considération :

SWIETENIA MACROPHYLLA; l'accajou; région de Saigon
KHAYA SENEGALENSIS; caïcedrat ou acajou d'Afrique;

Région de Saigon et Trang - Boun.

L'Arbouture et les parcelles de Trang-Boun donnent des indications intéressantes : ENTANDROPHARAGNA ANGOLENSA; originaire du Cameroun, fournit un succédané de locapre. Excellent développement. Le groupe des Swieté-Mioixés africains (Khaya, Entaudeophragma) qui dans certaines zones de leur aire de distribution ont souffrir de l'EPISCISTRATIS ELAPHITIS, dont la chenille creuse

...../.....

les rameaux, semblent ici indemne de toute attaque CHLOROPHORA AXCELSA; Graines du Cameroun fournit l'IROKO. Développement remarquable. LOPHIRA PROCERA; originaire au Cameroun; l'azoté est particulièrement indiqué pour les travaux portuaires vu sa résistance au Forêt. Bon développement à : à essayer dans les endovits frais ERYTROPLEUH GOINEENSE; du Cameroun. Semble plus vigoureux que l'E.FORD TERHINALIA IVORENSIS; Cameroun. Bon développement ou les qualités du sol.

ACACIA ANEURA est une révélation comme plante de première installation.

Parmi les pins : Pinus PATULA semble intéressant.

Par contre :

OCHROHA (LAGOPUS) ne semble pas trouver des conditions idéales.

EUCALYPTUS NAIDENH. Un sujet malingre à cime étriquée.

IV.- Plasticite et adaptabilité des espèces

(à voir)

V.- Ennemis et maladies des essences forestières

Jusqu'à ce jour nous n'avons constaté aucun dégât important aux essences indiqués.

Les espèces exotiques ont par contre des ennemis :

Les Eucalytus et certains cyprès sont décimés par les termites à Trang-Boun;

Le CHLOROPHORA EXCELSA indemne de toute attaque de PHYTOLINA LATA à la station de Trang-Boun, y a par contre un ennemi inattendu : le proc épïc détruisant les pivots. Nous n'avons pas vu le déprédateur, qui normalement s'en prend aux racines de manioc, mais des restes de pivots se trouvaient encore entre les lignes de plantation.

VI.- Utilisation du bois .- Détermination des espèces importantes

a)(Enquête sommaire sur les principales espèces utilisées en vue de les favoriser) Visite de la S.I.F.A (Société Indochinoise Forestière et des Allumettes) à Saigon le 30-12-55.

- Précédemment installée à Hanoi la firme employait principalement le STYRAX tonkineusis.

- Actuellement les essences de base sont le PODOCARPUS et le BUT (espèce indéterminée provenant de la région de Nha-Trang). L'analyse des allumettes fait apparaître d'autres espèces fenillures qu'une enquête près des exploitants pourrait faire connaître.

...../.....

B) Possibilité de substitution :

(Comparaison des propriétés des diverses espèces -
Espèces exotiques).

c) Utilisation des non valeurs:

(Carbonisation, fabrication d'agglomérés, etc...)

L'implantation de réfugiés .

Au cours de notre rapide voyage il nous a été possible de voir le long des routes de nombreux villages construits par les réfugiés. Ils se situent généralement sur les terres domaniales et en région forestière, du fait des circonstances aucune étude préliminaire n'a pu être faite et dans bien des cas ces emplacements sont incontestablement provisoires.

L'implantation des réfugiés dans les régions basses où la culture du riz irrigué ou flottant est possible est la solution envisagée sous forme de déplacements massifs dans des zones actuellement quasi décultes. Ceci me semble une méthode coûteuse et présentant de nombreux aléas. Une rapide enquête et dans certains cas une assistance immédiate permettrait de les fixer: par exemple : A \approx 40 km de Saïgon sur la route de Dalat le village BUI-CHU comprenant environ 1.100 famille soit quelque 6.000 personnes semble s'organiser d'une façon définitive. Actuellement l'activité de cette communauté est orientée vers l'exploitation forestière, principalement le bois de chauffage, l'extraction de gravier, la fabrication de nattes. A part quelques arènes plantés près des maisons, l'agriculture se réduit à peu de choses : ils disposent d'autant de terres que culture qu'ils désirent, mais cette libre disposition est un danger pour la forêt et le sol. Par contre ils auraient trouvé à environ 6 km au Nord de la route un emplacement convenant pour l'établissement de rizières irriguées d'une étendue de 500 - 1.000 ha. Il semble que des spécialistes pourraient payer de l'opportunité de ce choix et dans ce cas leur faciliter immédiatement la mise en culture.

A part les Vietnamiens, les réfugiés comportent des montagnards se contentant de tirer leur subsistance des rizières. Un de ces villages, HOANG-AN, s'est installé près de Pleiku et comporte \approx 1700 habitants, ce sont des tisserands, ils disposent librement des terres domaniales entourant leur village. Il me semble que dans le même cas, un essai de groupement des champs à soumettre à une rotation déterminée, un village pilote, faciliterait dans la suite l'application

...../.....

chez les autabtones. Nous avons prévu un retour dans la région de Banméthuôt où de grandes étendues de terres apparamment boueuses, mais enfouies sous EUPATORIUM, pourraient revenir à l'établissement de tels villages modèles.

De toute façon l'implantation définitive dans une région déterminée ne pourrait se faire qu'afin une enquête sérieuse déterminant :

- 1°/ la superficie de terre disponible.
- 2°/ la qualité de celle-ci;
- 3°/ la superficie à accorder à chaque famille;
- 4°/ les cultures vivrières possibles;
- 5°/ les cultures industrielles
et d'exportation éventuelles;
- 6°/ le type de jachère etc....

UNITED NATIONS ECONOMIC SURVEY MISSION
TO VIET-NAM

Interim Report by J.Von Monroy on Forestry
and Forest Industries

The target : investigation of the strong and weak points of forestry in Viet-Nam for establishing priorities within the Forest Industrial Development Programme under review.

The situation (including major recommendations) :

I Forestry

- (1) Area : The country lost by the partition about 50% of the forest area (prewar : 13.5 million ha.) About 30% of the total area of the country is still under some kind of forest.
- (2) Production capacity : In spite of the disturbances the requirements in timber and fuel have been met during the past decade, but only by exhausting the accessible areas, whereas the less accessible remain undeveloped. Consequently, the uneven distribution of the production forests has been greatly accentuated.

In spite of the rather favourable ecological conditions, a crisis in the timber supply (at adequate prices) can be anticipated within a short period unless the exhaustive exploitation methods, caused by the war, are replaced by a broad forest development and conservation programme for the whole of the country. Otherwise the minimum requirements of :

300,000 m³ timber (round) and
300,000 " firewood per year

will be met only if at all, at unreasonably high prices.

- (3) Destruction of natural vegetation : Besides the recent destruction due to the war, there are several hundred thousands of hectares of former forests which have been turned over into poor grasslands by shifting cultivation, now occupied by *Imperata Cylindrica* (mainly in the mountain areas.) The destruction of natural vegetation reached an alarming stage along the densely populated coastal areas of Central Viet-Nam, where villages have been covered by shifting sand-dunes and where costly reforestation is imperative.
- (4) Main types of the existing forests.

- (a) "Forêts denses" in the more humid lowlands, consisting of several hundred broad-leaved species, only partly introduced in trade.
- (b) "Forêts claires" in the drier areas, a savannah type, greatly reduced in production capacity by fires (caused by human activity.)
- (c) The pine forest of the high plateau (PMS), a great potential source of long-fibre raw-material.
- (d) The tidal forest (Mangroves and "arrière mangroves") in the south, the main resources of fuel (fire wood and charcoal) and of tanning material.
- (5) Steps to be recommended
 - (a) Inventory of the existing areas and the standing stock under economic and technological aspects.
 - (b) Strengthening of the Forest Organisation by doubling the administrative staff and tripling the number of the personnel in the field.
 - (c) Development of the more remote forest areas by road construction.
 - (d) Reorganisation of Forest Research (now under the Ministry of Education) according to practical requirements.
 - (e) Preparation of an overall land-use policy with respect to closer coordination of agriculture and forestry, but especially with reference to the unused land (about 50% of the total area of the country.)
 - (f) Allocation of the net income from forest for the Forest-Industrial Development and Rehabilitation Programme for a period of at least five years to compensate gradually for the destructions of the past.

II Forest Industries (Some points of high priority)

(a) Paper production

The analysis of consumption shows a per capita rate of 2 kg./year and an annual increase of about 10%. Viet-Nam at present depends entirely on imports in spite of the availability of suitable resources.

Project 1 : Paper Factory in the Dalat-Dran Area, starting with 20 tons of writings and paintings a day and doubling the capacity after reaching full production. (Raw material : Pinus Khasya.)

Project 2 : Paper Factory about 120 km. north-west of Saigon for utilisation of the 80,000 ha Bamboo Forest, if the survey proves the availability of sufficient raw material.

Project 3 : Factory for the production of cardboard and wrappings from the tope of rice straw (in combination with domestic long-fibre pulp from Project 1 or 2.) Only to be started after the above 2 factories reach full capacity.

The main date en the above projects will be included in the final report.

(b) Building material

The requirement housing - under the Government schemes only - amount to 4,000 at present and are likely to increase to 15,000 houses annually from 1957 on.

For reducing cost of building material and to develop an outlet for the non-commercial timbers, the following projects are recommended :

(1) Production of cheap building boards from sawdust and shavings (without using synthetic resins) for prefabrication of house units (for settlements).

(2) Production of semi-light building units from mineralized wood (wood-wool). Also applicable for buildings up to 9 stories high.

(c) Decentralization of fuel and power production.

Planting of fast growing firewood species around houses and villages in areas of shortage for saving transportation cost (Cooperation between the Forest Department, for the supply of seed, and the Agricultural Extension Service for the general information of the public.)

Establishment of wood gas-producers connected with Diesel-motor in areas distant from the transmission lines.

All specific problems will be discussed in the final report.

UNITED NATIONS ECONOMIC SURVEY MISSION TO VIET-NAM

INTERIM REPORT BY T.H. ROBINSON
ON INDUSTRY

In an effort to report on the past, present and potential industrial situation in Viet-Nam, it was considered essential at the outset to ascertain the attitude of the Government toward industrial development. The Government has indicated its desire to promote such development as an important part of the movement toward economic independence. Yet there is a danger that the country will impair its industrial resources and potential by favouring purely Vietnamese enterprise even at the risk of a serious check to industrial development

It is of course natural and highly desirable that the Government should encourage the increased use and development of Vietnamese capital, technical and managerial skills, and marketing facilities. But these are not now available in sufficient volume for industrial growth on the scale desired, and their further development will take time. Meanwhile the larger manufacturing enterprises already established in Viet-Nam have been financed almost entirely by foreign capital and rely mainly on foreign managerial and technical skills. Discouragement of these enterprises tends to bring about a decline in industrial activity rather than the major increase which the Government and the people desire.

Expansion and reinvestment by certain existing enterprises has been checked by the belief that Government policy was intended to force out foreign-owned industries by the development of parallel industries under Government sponsorship. Certain industrial enterprises have come to a virtual standstill because of uncertainty as to what punitive or restrictive measures might be expected from the Government. The attitude of their directors may be summed up as : "Let's do nothing in the way of expansion until we see what the Government is going to do."

It is therefore believed that a direct, definite and specific statement of Government policy which would show its intention of co-operating with industrial development in the country would do more than any other one thing to promote a revival of industry in Viet-Nam.

In the administrative table of organization of the Government, industrial matters are handled by a Bureau Chief of Industry who reports to a Chief of the Industrial Section; who reports to a Director-General of Mines who reports to the Minister of Economy (along with two other Director-Generals, a Secretary-General and a Director of Economic Cabinet) who reports to the President. It is strongly recommended that this chain of command, which tends to relegate industrial matters to a most minor concern of the Government, be revised, and that a Ministry of Industry, on a par with the Ministries of Agriculture, Finance, etc., be established.

There is an urgent need of vocational training to fit the Vietnamese for their anticipated role in industry; this programme should include vocational teacher training, reasonably well equipped vocational training centers and an extensive programme of foreign technical education for those qualified to profit by such overseas study. A measure of the lack of availability of skilled labour is readily apparent when it is realized that the compensation received by the skilled worker in Viet-Nam is twice that of the unskilled worker whereas the differential (average) in more industrialized countries is in the nature of 20%.

The further suggestion is made that a Vietnamese Institute of Technical Applied Research be immediately established, manned by as many imported technicians, experienced in this particular work as necessary until such time as local talent is available to assume its direction and operations, to initiate and carry through technical and economic research, establish pilot plants, explore marketing possibilities, etc., on the basis of the best commercial exploitation.

A programme of small industrial loans to individual and family entrepreneurs should be immediately set up to enable and encourage the purchase of more modern equipment for small industries; these loans should be available with a minimum of security, at very modest interest rates and for a period of time that would enable them to be amortized out of increased earnings.

Investigation should be started immediately to determine the feasibility of producing fertilizer from the garbage of large centers of population instead of using it as fill as at present; if practicable, such a plant should be started and put into operation at the earliest possible date.

Waste from forestry products, such as shavings, sawdust, etc., should be utilized for the manufacture of interior and exterior building panels which could be produced, to help relieve the shortage of building materials and bring down their prices, without importation of raw materials and at the same time give needed employment on a cottage industry basis.

A programme of handicraft production using elementary equipment should be immediately inaugurated, under the guidance of competent personnel, among the rural populations, to supplement their income which is pathetically low; the marketing of the products to be produced should be surveyed and determined as a prerequisite to actual production, with aid in securing the necessary raw materials, if necessary.

Specific recommendations applying to specific industries will be further elaborated upon in the final report on industry.

UNITED NATIONS ECONOMIC SURVEY MISSION TO VIET-NAM

INTERIM REPORT BY MARCEL SCHWOB
ON MINERAL RESOURCES

1. The "Plan de développement industriel et artisanal" received by the Mission from the Direction Generale du Plan refers to mineral resources development only under "Energetique" in paragraph 5 of introductory Chapter I and specifically to :

Peat of the Uming area
Coal of the Tourane area (Nong Son mine)

The same paragraph 5 specifies that "the problem of low-cost electric power will be examined in the Plan for Public Equipment". However, at the time of this writing, no detailed chapter on power of the Industrial Plan nor the Public Equipment Plan have been made available to the Mission.

2. It appeared rapidly that specific advice on mineral and fuel development could be given only within the framework of an integrated fuel and power policy, and that one of the main needs of the country was the study at policy level by a specialized expert, of the power problem and particularly the power market. Relevant recommendations to the Directeur general du Plan were drafted jointly with Mr. P.T. Tan on 15 December 1955.

3. The foregoing reservation did not, however, prevent the expert from giving his attention to specific projects or problems of which he was apprised by the Directeur general des Mines et de l'Industrie (under the Ministry of Economic Affairs) who for practical purposes represented his counterpart.

a. The Nong Son coal mine : As the natural source of coal for South Viet-Nam was the Haiphong area this deposit has been exploited only sporadically in the past. From the preliminary studies made by French experts it would appear that the present needs of the country, about 100,000 tons per year, could be covered during two or three years by an extension of the existing open cut, but subsequent production would require investments for prospecting, access works, mechanization and coal beneficiation which should be studied in the light of (2) above.

Furthermore, the known analyses indicate a sulphur content of two to three per cent which, if confirmed, would make the coal unsuitable for the main prospective users, i.e., the Saigon power plant and the railroads.

b. The Uming peat deposits : Interest for this substitute fuel arose in 1944 but the tests were discontinued because of disturbed conditions. Again with (2) above in mind, an economic and technical study would be needed, also taking into account the reservations made at that time by the Forestry Department (competition with firewood market) and the Hydraulics Department (repercussions of depletion on drainage).

c. The phosphate deposits of the Paracels Islands : The country possesses there, under operating conditions far from insuperable, a fertilizing material which, according to the agricultural experts of the Mission, has an almost ideal composition (up to 15% soluble P₂O₅), would not require any chemical treatment and only a relatively modest investment for handling and bagging. Since agricultural and particularly rice development are the No.1 objective of the Plan, it is believed that the development of these phosphates deserves immediate technical study.

d. General organisation of the Direction Generale des Mines et de l'Industrie : An excellent project has been submitted to the Ministry of Economic Affairs, obviously and logically inspired from the previous French organisation with the difference that the Geological Survey is now a part of the Centre National de Recherches scientifiques et techniques (Ministry of National Education). In spite of certain shortcomings this separation finds its justification in the fact that the only senior geologist in the country, a French expert seconded to the Government, will also teach geology at the Universite du Viet-Nam and, furthermore, that its Rector has expressed interest in the short-term training programme of geologists-technicians suggested by the expert. The question of staffing will be more generally the subject of paragraph 4.

No Water Resources Branch is included in the proposed organisation but in view of staffing difficulties, this seems to be justified since the water problem is rather one of excess than of deficiency and, furthermore, there is at present in operation a Meteorological Survey handling problems of stream gauging.

It may be mentioned here that the Meteorological Survey is planning the establishment of a geophysical station with assistance under the Colombo Plan. Though it is believed that under current conditions of staffing and finances the project hardly deserves a high priority, certain data may be obtained that will further the eventual application of geophysics to mineral research.

e. Establishment of a Bureau d'Etudes minieres : Within the organisation subject of (d) above, this branch would be in charge of actual prospecting operations. The idea is inspired from what has successfully been done in several French overseas territories but again the difficulty will be staffing. A request has been submitted to the Direction Generale du Plan for prospecting experts and equipment under the Colombo Plan with a view to the exploration of metallic minerals, Nong Son coal and geophysical prospecting. The expert believes that the order of priorities should be coal, then metals and (remotely) geophysics.

4. The staffing difficulties mentioned above, which besides finances are the main obstacle to the development of any organisation and operation, may be alleviated as follows :

a. As a short-term measure, by outside technical assistance and by putting to work all nationally available elements, which in turn will require a detailed professional classification of all specialists among the 3,000 miners said to be among the refugees, and convincing to return home the young Vietnamese completing or having completed their studies abroad in mining or geology.

b. Setting up of a national training programme aiming mainly at the training of geologists, prospectors, surveyors and mining specialists at the technician level, that is for a duration of six months to a maximum of one year with intensive in-service training, initially under the guidance of foreign experts. Fellowships and scholarships to study abroad should be granted sparingly and only to subjects selected from the above programme on the basis of their achievements. The willingness of the University of Viet-Nam to co-operate in this programme has been mentioned under (3d) above.

5. Another standing difficulty is the lack of documentation of which much was lost during the evacuation of the DGMI from Hanoi. It is regretted that valuable papers recently published and circulated by ECAFE on

problems of immediate interest to the country, like utilization of low-grade coals and integrated power policies, do not seem to reach the Government's offices at the working level.

6. The expert plans to devote the remainder of his assignment, in addition to the drafting of the final report, to the questions listed above with main emphasis on the Nong. Son coal and the Paracels phosphates; field trips to both are planned by the DGMI for January. Some attention may be given to metallic resources but it is believed that for years to come the only possibility will be their export as raw materials until available fuel or power allows their more or less complete beneficiation or smelting. Of course, the expert will study any specific problem on which his advice is sought by his colleagues of the Mission.

UNITED NATIONS
ECONOMIC SURVEY MISSION TO VIET-NAM
INTERIM REPORT BY P. T. TAN
ON DRAINAGE AND IRRIGATION

1. With regard to programme of irrigation and drainage works, there are essentially two problems to be considered, namely, the programme of rehabilitation of drainage and irrigation works damaged during the war and the programme of new works to be undertaken in the coming years. Attention is to be given to an analysis of the priority of projects to be executed and to the coordination of irrigation and drainage projects with inland transportation, agricultural and other development schemes. It is also deemed desirable that any immediate or short term measures to be undertaken should be consistent with the policies to be adopted for long range development.
2. The programme of rehabilitation of irrigation and drainage works in 1955/56 has been prepared by the Ministry of Public Works and is included in the "Plan of Agricultural Development" prepared by the Directorate of Plan for the mission. Numerous discussions were held with officials of the Ministry of Public Works with regard to the rehabilitation programme. A field trip to examine one of the typical projects, the Soctrang project, located at the southern coast of the delta, was undertaken jointly with the Director-General and the Chief of the Agricultural Hydraulic Service of the Ministry of Public Works. Field trips to projects located in Central Viet-Nam are scheduled to be undertaken in January, 1956.
3. A review of the existing condition of irrigation and drainage works is being made. There is little doubt about the justification of rehabilitation of projects already completed before the war. The problem now facing the Agricultural Hydraulic Service is the lack of trained technicians to handle the execution of works. The present staff in the Agricultural Hydraulic Service consists of 5 engineers who have been with the service for over 20 years and 5 junior engineers graduated recently from the school of Public Works in Saigon, as compared to a total of approximately 50 engineers in the Service before the war.

4. No definite plan has yet been prepared by the Ministry of Public Works or the Directorate of Planning for irrigation and drainage works that are to be undertaken after 1956. It is on this problem the Mission is devoting its attention. According to the idea of the Ministry of Public Works, preference will be given to the execution of schemes for which plans had already been prepared before the war. This involved quite a number of large schemes, the notable ones being the Quanlo scheme, the Trans-Bassac scheme and the project of the Plain de Joncs which would cover an area of million hectares. As to the priority to be given

to these projects, opinions expressed by the former Director-General of the Directorate of the Plan differ from those of the Director-General of Public Works.

5. Analysis of the justification of these projects will be made to the extent that available data permit. In the mean time, consideration is being given to the question of whether efforts should be made to further improve the drainage and irrigation on area already under cultivation, (as for example provision of irrigation facilities for the sowing of a second crop other than rice in the delta), rather than the provision of irrigation and drainage facilities to new areas. Such a comparative study will take into consideration the physical character of the various areas and the future policy of agricultural development. It may be mentioned here that conditions prevailing in certain area are not yet favourable for conducting field investigations without which no judgement can be made. However, the Mission will be in a position to give a general indication of the programme that might be undertaken and recommend lines along which further investigations are to be made.

UNITED NATIONS
ECONOMIC SURVEY MISSION TO VIET-NAM
Interim report by W.J. Van der Oord
on inland waterways and
inland waterway transport

My assignment concerned inland waterways and inland waterway transport (IWT). During the four weeks I stayed with the mission, I was able to complete the preliminary work that appeared necessary to get a clear picture of the situation.

It was found that at the Directorate General of Plan no staff member had so far been able to devote any considerable length of time to the subject of inland waterways and IWT. However, the Director General himself seemed to have a clear idea of the overall situation and he gave me a valuable briefing on the subject in general. For further details, I went to the Directorate General of Public Works, where I spent most of my time. I had one interview with the Inspector General and two with the Director General of the latter organisation and further regular contacts with officers in charge of the Navigation Service. They were able to supplement the information already available with ECAFE on pre-war fleet strength and the extent of destruction, that took place during the period of internal disturbances. Also, they were able to supply data on pre-war inland waterway traffic flows, on dredging and on the extent of shoaling of navigable waterways that had taken place during the 12 years when hardly any maintenance dredging could be done.

From documents collected from various sources, an impression could be gained of the areas where, before the war, various products were grown or produced and of the amounts that had to be transported from various locations by inland waterways. It is clear that paddy formed the bulk of IWT cargo before the war.

I also inspected a number of local shipbuilding yards, both those where the time-honoured junks used to be constructed and maintained, and the modern ones where steel vessels are being built. From these visits and later consultations with the managers, I was able to get a fairly good idea of construction costs pre-war and post-war and of the building capacities of various yards and the difficulties that may be encountered in bringing the fleet strength back to pre-war level.

When I departed on 14 December, I left instructions with one staff member of the Directorate General of Plan to collect further data that might be useful in checking the information obtained by me.

With the material and information now available I expect it will be possible to give an analysis of pre-war IWT in relation to pre-war production and consumption. On the basis of this, we shall be able to predict the post-war need for IWT once the post-war production and consumption pattern is known and various targets have been set. In making such a prediction, new factors affecting the traffic flow, such as the development of new ports (Cantho) will, of course, have to be taken into account.

As a result, it will be possible to indicate the size of the fleet necessary to meet future transport requirements. In any case, however; it appears that, as a first step, a beginning will have to be made in reconstructing the destroyed part of the fleet. In doing so, an excellent opportunity exists for modernization and, therefore, due attention will be paid to the possibility of recommending building of allwelded steel barges to replace the large wooden junks. Consideration will also be given to methods of financing the reconstruction and of operating the new fleet. In this respect, past history and present situation seem to point at the desirability of relying largely on private enterprise and restricting the role of the Government to providing assistance and guidance.

Furthermore, immediate rehabilitation of the waterway system through dredging is obviously necessary and, therefore, recommendations for efficient use of available dredging equipment may well be included in the final report.

UNITED NATIONS ECONOMIC SURVEY MISSION
TO VIET-NAM

Interim report by Kavila na Chiengnai
on Highways

Having been here only two weeks, and had time to inspect only one road, my interim report cannot consist of any precise recommendations, but only first impressions gathered from that one trip plus outlines of significant information obtained from interviews with Vietnamese Government officials and USOM delegates.

Forecast of Recommendations

At the present stage only a rough forecast of recommendations can be formulated. According to information obtained from several sources, there is no doubt that the country's 11,800 kms network of national, provincial and local roads is in such a bad state of repair that it has become quite inadequate for even present-day needs. Due to eight years of civil war which ended in July 1954, only to be followed by other internal uprisings and sabotage work, and also due to total neglect of even elementary maintenance, this country's road transportation system, once the envy of neighbouring countries, has deteriorated to its present-day state where many long stretches have become practically impassable to automotive traffic owing to the invading growth of jungle vegetation, and in many other portions no traces of paving can be found. As for the bridges, on route No.1 alone 134 out of a total 475 have been totally destroyed or so badly sabotaged as to be beyond repair. Even the roads that have suffered little from war damage have deteriorated through lack of maintenance.

Consequently, the principal problem now confronting the Vietnamese Government in this field is the very urgent need for an overall rehabilitation of their road system in order to bring it up to meet requirements of modern standards so as to be adequate for present-day needs first of all, and then to gradually incorporate changes and improvements to cope with the ever-expanding economic needs. How to achieve this end will be the final aim of the following recommendations.

a) Reconstruction priorities. The Rehabilitation project as alluded to above is so broad in scope and large in magnitude, that its successful execution within a short period of years is unthinkable, due to the size of capital investment that would be needed, as well as due to the lack of trained personnel. It is, therefore, necessary to work out a system of priorities based on the type of work together with the urgency of the need of the use of that particular road or a part of it.

Generally speaking, this global reconstruction work should be divided into two separate stages or phases. Stage I should

consist of such work, even temporary work, that is immediately needed to render a road usable for present-day traffic, but strong enough to last five to ten years in that passable state with only the assistance of the usual maintenance. Phase I work should be completed within a period of one or at the most two years. The type of work should consist of (where needed) grubbing, widening of shoulders, providing for drainage, shaping and compaction of roadway base, paving and surface-treatment work, repair of existing bridges, construction of temporary bridges so as to reduce to a minimum the necessity of using ferries. It is not the aim of this Phase I work to bring the road up to the required standard, but to provide a passable roadway on which traffic can move safely at a reasonable speed. Another important work to be done during Phase I is to collect traffic and other data, so as to plan out the details needed to put into operation stage II construction projects.

Stage II projects should consist of the construction of permanent structures and other improvements that had previously been planned and rectified, where needed, according to supplementary information and data gathered during the course of engineering work performed during the first Phase. Work included in the second Phase is composed of : a) the same kind of improvements as in Phase I made on the remaining portions, b) the construction of permanent bridges, and c) generally speaking, improving the road's standard to meet modern traffic requirements whilst keeping in view the necessities of future requirements. The work for this second stage can be spread out over five to ten years as may be dictated by funds available.

There is no doubt that highest priority should be given to route No.1 because of its general economic importance, which is greater than any other dozen national roads combined. It is the main highway artery, 1,243 kms in length, connecting western and northern Viet-Nam, whilst passing through the country's most populated and most productive-area in South Viet-Nam (i.e., the Saigon area), before proceeding northwards to link up the country's biggest towns which all happen to be situated on the eastern coast line. Statistics also show that most of the country's population north of Saigon live within reach of this route No.1.

As for the other remaining eight national roads whose total mileage amounts to about 1,600, i.e., only a little more than that of route No.1, there is some divergence of views regarding their priority. A more detailed study and more information regarding their present condition and traffic data are required before a recommendation regarding their priority can be made.

There is also a considerable network of interprovincial roads serving the heavily populated flat delta area south

of Saigon. These also need renovation and new bridges. Amongst these the most important one is road No.4, needing fairly high priority owing to its economic importance. Work on the other roads can be deferred because this delta area is already provided with both natural and hand-made waterways more suitable for the locality's mode of transportation.

The following is a recommended classification for reconstruction priorities as at present foreseen :

<u>Priority I</u>	Nat. road # 1 (total length 1,243 kms, out of which 700 kms are recommended for this priority)		Total	700 kms
<u>Priority II</u>	Nat. road # 21	length	158 kms	
	1st part of general interest road # 4	"	60 "	
	1st part of Nat. road # 14	"	160 "	
	Nat. road # 15	"	96 "	
	Nat. road # 19	"	<u>136 "</u>	610 kms
<u>Priority III</u>	2nd part of Nat. road # 14	length	160 kms	
	Nat. road # 13	"	154 "	
	Nat. road # 20	"	302 "	
	Nat. road # 11	"	<u>105 "</u>	721 kms
<u>Priority IV</u>	2nd part of general interest road # 4	length	200 kms	
	3rd part of Nat. road # 14	"	160 "	
	Interprovincial road # 8	"	<u>150 "</u>	510 kms
<u>Priority V</u>	The remainder of Nat. road # 1	length	543 kms	
	Nat. road # 9	"	<u>85 "</u>	628 kms
Total mileage of recommended reconstruction				3,169 kms

The above mileage may seem big at first glance, but it is only 27% of the total mileage of the country's network of roads. However, the other roads not mentioned above are of much less importance and only need the usual maintenance care for the times being.

b) Reconstruction of Bridges. It has been indicated above that on route 1 alone 134 bridges have been damaged. Many of these, particularly the smaller ones, have been repaired or replaced by temporary structures. Nevertheless, there seem to remain nine major river crossings still to be dealt with either by more adequate ferry services or by temporary structures such as Bailey bridges. This work should be done in Phase I, whilst permanent structures can be built during Phase II.

c) Maintenance Expenditure. Whilst renovation work of roads and bridges is paid for out of capital expenditure, maintenance costs should be provided for out of a regular annual budget. Maintenance work should be considered as important as reconstruction work, because without the proper maintenance the best of roads will deteriorate very quickly—such as has been the case in Viet-Nam. Different types of roads require different maintenance costs. In order to keep roads in good condition it is estimated that \$900 (U.S.) is needed annually to maintain one kilometer of a national road, and about an average of \$600 (U.S.) for one kilometer of the minor roads which are narrower and have to stand less traffic wear and tear. This means that during the first phase of reconstruction work the Government will have to spend annually U.S. \$ 2.7 million for maintaining 3,000 kilometers of National roads, plus U.S. \$5.4 million for their 9,000 kilometers of provincial and local roads. (The above figures have been based on the official exchange of 35 piastres to one U.S. dollar).

d) Highway Finance. It appears that up to the present there has been no long-term planning in regard to highway financing, and that allocations for highway-expenditure vary from year to year according to the amount of funds available. This method may be convenient to the treasury but is unpractical and uneconomical for highway development. Highway financing should be placed on a sound footing with non-lapsing funds for each project or groups of projects. Without the assurance of continuing funds for a specified number of years ahead until the completion of the projects as previously planned, no systematic economic long-range programme can be carried out, particularly for the above reconstruction projects as recommended in a) and b), which will take several years to complete.

e) Lack of adequately trained staff. There is not enough trained personnel to carry out effectively the recommended reconstruction programme. Foreign technical aid is evidently a solution, but it can only be the beginning of the solution. Because of the long duration of the global work, staff will have to be trained locally. Sending engineers abroad to gain experience and special training will only cover a very small fraction of the personnel required, because this requirement extends over

a big field, from the skilled labourer right up to the high-ranking executive officer, passing via the equipment operators, the mechanics, the surveyors, the draftsmen, the field engineers, etc. It is therefore recommended that the Viet-Nam Government should let out parts of the proposed reconstruction to reputable contractors who have had wide experience in such matters. Such a contractor will have to use local labour, who in turn will be trained into skilled labourers, good operators and efficient mechanics. Vietnamese highway personnel will get acquainted with up-to-date procedures, organisation, and specifications which they will eventually adapt to conditions suitable to their local needs, and the opportunity to benefit from such experiences would be invaluable to themselves in particular and to the Government in general. A clause for training of Government personnel could also be included in the contract if needed.

f) Need for new design specifications. It has been found that roads in Viet-Nam, even the newly reconditioned ones, are still inadequate for modern traffic. The paved surfaces are too narrow, for the most part five to six meters wide, and therefore too narrow for two-lane traffic, and they are still provided with out-dated and objectionable high shoulder berms. The paving often is composed of insufficiently graded material, due to the lack of grading equipment and control devices. The embankment slopes are too steep. The existing bridges are too narrow. Except on a trial portion of a few kilometers near Cap-Saint-Jacques, it has been noticed that all the roads of the country have the above defects. In other words, there is need for the adoption of a new and higher specification standard. If this is ~~not seen to~~ during Phase II work, at any rate for the more important National roads, the Government of Viet-Nam will face major traffic problems within the next five to six years, when they will find that even their main arteries will again be hopelessly out of date.

CONCLUSION

At this present comparatively early stage of my information-gathering, I am unable to give any correct figures regarding costs. I hope to be able to gather more data during my next two field trips so as to be in a position to substantiate my final report recommendations with more facts and figures. Nevertheless, it is fully realised that even though the above-proposed reconstruction programme is what this country needs, it is much too costly for the Government of Viet-Nam to carry out (within a reasonable time period) without financial and technical foreign assistance and/or a substantial capital loan from the World Bank for Reconstruction.

This necessary financial and technical assistance, it has been ascertained, is forthwith coming from the United

States Government. There is, therefore, hope that this reconstruction programme will be carried out successfully to its final completion, which will greatly help towards the country's much needed economic expansion.

It is now a known fact that during the coming eighteen months (January 1956 to June 1957) the Highway Bureau of the Government of Viet-Nam has drawn up a Phase I reconstruction programme for Route 1, as follows: 451 kilometers of the worst portions will be reconstructed at the cost of U.S. \$ 12.9 millions, the U.S. Government contributing \$ 10.5 millions and the Viet-Nam Government \$.2.4 millions. This sum includes the erection of temporary bridges or ferries for nine major river crossings (at the cost of U.S. \$ 850,000). The United States is also to supply free of charge 2,400 m. length of Bailey bridge sections for temporary bridges. On the other hand, the Government of Viet-Nam will take care of the maintenance part of the programme by the provision of the official exchange equivalent of U.S. \$ 12.9 million during the same 18 months period. This means that at any rate Phase I Work for route # 1 is practically a "fait accompli", and that there is reasonable hope that the rest of the programme will likewise be carried out and accomplished.

UNITED NATIONS ECONOMIC SURVEY MISSION
TO VIETNAM

Interim report by G.A. JOHNSTON and C.W. AMOSS
on manpower and refugee settlement

Background Information

It is proposed to arrange the background information under the following four main heads :-

- (a) Manpower resources, including occupational distribution of the labour force, extent of unemployment and underemployment;
- (b) Action to provide employment, e.g., resettlement in agriculture, employment in industry and handicrafts, employment on public works and development works;
- (c) The refugee problem and special measures necessary for resettlement, including land settlement and organisation of fisheries and handicrafts centres;
- (d) Basic organisational programmes, including overall manpower survey and review employment service organisation, technical education and vocational training, application of labour legislation and co-operation between employers and workers, and productivity.

Conclusions and Recommendations

Consideration of the background information, as analysed and assessed under the above rubrics, appears to lead to the following Conclusions and Recommendations, relating in the main to basic organisational programmes.

1. One of the outstanding needs identified in the course of the work of the Mission is the need for comprehensive manpower information. If the Mission had had at its disposal detailed information on the regional and occupational distribution of the labour force and on the similar distribution of jobs, both actual and potential, much of its work in arriving at conclusions regarding possible industrial, agricultural and other forms of economic development would have been greatly facilitated. The need is a continuing one, and it can only be met by the organisation of a Manpower Survey linked with a permanent Employment Information programme, on lines similar to those which have proved practicable in other countries to which technical assistance has been afforded. One of the Manpower members of the Mission will remain in Viet-Nam for a year and one of his functions will be to advise the Government on the measures necessary for carrying out such a Survey.

2. In planning and implementing a comprehensive manpower policy for development, fully adequate employment service organisation is essential. While a useful nucleus of employment exchanges already exists in Viet-Nam, the system needs to be developed, to provide on the one hand for a greater number of well-staffed and well-equipped offices and, on the other, to widen the scope of the service so that not only placement functions may be performed but that up-to-date information may constantly be available on the needs for various categories of manpower and on the occupational qualifications of the existing labour force.

3. An immediate need exists for an expansion of technical educational and vocational training facilities to meet current unfilled demands for skilled and semi-skilled labour and to ensure that sufficient trained workers of various categories will be available to meet expanding needs during the implementation of economic development plans. A good beginning has been made in the training workshops and apprenticeship - centres and in the primary and secondary technical schools and also in the evening vocational training courses. There is, however, an urgent need, as soon as additional teaching personnel and classroom and workshop accommodation and equipment can be provided, to increase substantially vocational training facilities for skills for which current and future needs can be precisely assessed and estimated as a result of the improved informational organisation recommended in paragraphs 1 and 2.

4. There is an even more acute need for technical, supervisory and managerial personnel. The existing higher technical schools (Nautical, Radio, Public Works, Engineering) are doing good work in training the necessary personnel in these particular sectors, but these activities need to be supplemented by training in sectors for which no higher technical training is at present provided in Viet-Nam. One of the sectors in which such training is particularly urgent is the technical and financial administration of co-operatives. In various parts of this report reference has been made to the rapid development of agricultural and other co-operatives. If the hopes placed in these societies are to be fully realised, it is urgent to train the personnel who will bear the detailed day-to-day responsibility for their technical and financial operations. There are two complementary ways in which, in all the sectors in which further training facilities are needed, such training may be provided. One is to send Viet-Nam candidates abroad for periods of intensive training, the other to bring to Viet-Nam a small number of carefully selected instructors. Thanks to various international and national programmes, fellowships for study abroad are available on an extensive scale for Viet-Nam candidates and arrangements also exist for the recruitment of qualified instructors.

It is recommended that the Government should make the fullest use of these facilities.

5. Although there is a comprehensive system of labour legislation in Viet-Nam, measures are needed to render its application more effective. These measures might include, on the one hand, an increase in the personnel of the labour inspection service in the Ministry of Labour, and on the other the organisation of educational campaigns, illustrated by posters, for securing more general compliance with the provisions of the Labour Code and the Agricultural Labour Code, for example, those relating to Health, Safety and Welfare.

6. In other parts of this report, reference has been made to various development works or public works to which it is recommended that priority should be given. From the manpower standpoint, special attention is drawn to those development works which will not only provide some immediate temporary work for the unemployed but, even more important, will facilitate the permanent resettlement of substantial groups of refugees and other unemployed members of the population.

7. For reasons which are mentioned in various parts of this report, Viet-Nam cannot remain indifferent to the question of raising productivity. In view, however, of the many urgent problems to which immediate attention must be devoted, it would be unrealistic to suggest that high priority should be given to measures to raise productivity. Nevertheless, the importance of the question should not be overlooked. The Government should consider setting up, in due course, after consultation with the National Advisory Committee on which employers and workers are represented, a National Productivity Centre, the chief initial function of which would be to prepare the way, by appropriate educational activities, for measures, to be taken when the time is ripe, to raise national productivity.

8. In the limited time available to date it has not been possible to undertake any detailed examination of the refugee problem; neither has it been possible to assess the degree or effectiveness of the co-operation between the Office of the Commissioner for Refugees and other Government departments which are less directly concerned with this national problem.

9. It is, however, clear that although hardly any of the refugee centres have yet developed into self-supporting communities, there are already indications in some areas that an increasing number of them will eventually become entirely self-supporting. This applies particularly to those areas where land is available for rice production and to those centres where handicraft industries and co-operative societies are being developed.

10. It is also known that a relatively small number of those who originally came south as refugees have found permanent or semi-permanent employment of their own accord, e.g., those with particular skills, professional men, etc.

11. To reduce the problem of the remaining refugees to manageable proportions, there is an urgent need for :--

(1) Transfer of refugees in unfavourable to more favourable resettlement areas on a community basis;

and,

(2) transfer, on an individual basis, of unemployed mobile labour in the refugee centres to areas where it can more readily be employed.

12. These conclusions emphasise the Mission's recommendations about the need for a national manpower survey and an overhaul of the employment service organisation. But to reduce the additional manpower problem created by the refugee situation, the Mission feels there is an additional need for a comprehensive occupational analysis of all the available manpower in the refugee communities.

13. The I.L.O. expert who is to remain in Viet-Nam (under the 1956 Technical Assistance Programme) after the Mission has completed its task, is required under his term of reference to devote special attention to the refugee problem. The main conclusions to be drawn from the results of his further enquiries will be communicated to the Government in due course but in the meantime he will be proceeding on the general lines of the foregoing recommendations, subject to any modifications which may be necessary as a result of more detailed examination of the problem.

UNITED NATIONS ECONOMIC SURVEY MISSION TO VIET-NAM

INTERIM REPORT BY F. ROSEBERY
ON FINANCIAL POLICIES

I. The Postulates

Development is the key word of the Mission's Report. Development rests on capital formation; in underdeveloped countries such as Viet-Nam, capital formation has often been associated with damaging inflation. Although inflation may itself engender some capital formation, the Mission categorically rejects inflation as an engine for this purpose. Thus the preoccupation of Mission thinking is development without inflation. The problems of deflation are purposely passed over as alien to development programmes.

II. The Basic Recommendation

The governing recommendation therefore is that inflationary tactics in the course of development be avoided; two important ancillary recommendations are that in Viet-Nam the Government (1) direct the savings-capital formation function as such but as far as possible make these resources available to the private sector of the economy for spending; (2) as far as possible, direct the savings function through fiscal and monetary policies based on incentive and decenterive measures rather than through direct controls. The State will thus endeavour to create a climate in which private enterprise will serve both the country and itself. Specific recommendations will tend to rest on these approaches.

III. The Real Meaning of Capital Formation

The basic issue is the allocation of Viet-Nam's resources. Each year, this country generates a certain output; part of this output consists in goods which are consumed, mainly consumption goods; the balance, which is not consumed consists mainly in capital goods (equipment). Moreover, in addition to its own output, Viet-Nam has at its disposal a further resource, made available through loans and grants extended to Viet-Nam by other friendly nations. This standby output may be taken in the shape of producers goods, consumption goods or a combination of both.

Of total available output, internal and external, a certain amount will be consumed. The balance equals investment. Due recognition once given to imperative consumption requirements, the Mission recommends that Viet-Nam exercise all efforts to allocate as large a share as feasible to investment-spending for purposes other than consumption and minimizing consumption goods inventories in this non consumption component. It is only thus that an effective development programme will materialize in fact and that economic independence - the goal of the programme - will come to be achieved.

IV. Capital Formation and Financial Stability

To achieve development in a setting of financial stability requires that Viet-Nam refrain from spending more than can be secured at current prices. An appropriate share of available resources, the existing pie, i.e., domestic output plus foreign output made available to Viet-Nam beyond what Viet-Nam's reports procure, must be reserved for investment. This must be done against a backdrop of a reasonably stable money supply if it is to be undertaken without the social injustices and economic injuries of inflation. Expenditures on development, in due course, as they reach fruition will increase the size of the pie and concomitantly the share of consumption, without the disturbing maladjustments of inflation. The Mission therefore recommends that Viet-Nam avoid resort to credit creation on a significant scale by the State as a means of securing resources for development.

V. The Technical Guide Posts for Development without Inflation

A first prerequisite of development without inflation is an assessment of the size of the development programme which Viet-Nam can afford without major price disturbances. This Mission's Report on Agricultural and Industrial Development has not estimated its cost in money. But even had this Report developed such a figure, it would not by itself have allowed of any significant comment as to its suitability. It is therefore recommended that Viet-Nam, on the basis of the National Income Data now being collected, compute total anticipated investment in the public and private sectors - inclusive of such projects recommended in this Report that Viet-Nam will come to adopt - and measure them against the Estimate of Savings - Foreign and Domestic, public and private, to determine, in the Savings-Investment National Accounts Analysis whether the level of the

Development Programme established by the Direction du Plan appears appropriate. At the same time, the fiscal and monetary policies, recommended and outlined later in this Report, will serve both to shape the magnitude of the Savings and - in the private sector, the direction of Investment.

As development programmes have historically so often evoked inflationary repercussions, the Mission recommends as a further precautionary measure, surveillance of money supply changes as a verification of the correctness of any decision on the proper size of the level of investment, based on National Accounts. This money supply study should be made on the usual sector - (a) external accounts, deficit deflationary, surplus inflationary, (b) working capital position of the Treasury, increase deflationary, decrease inflationary, and (c) banking credit with impacts same as (b) - so that the contribution of each sector to the trend may be localized and appropriate action applied at the right place. The Mission takes the occasion to point out that both these comprehensive exercises are significantly revealing in the last resort and should override the piece meal approaches to financial stability matters indicated later in this Report.

VI. The Sources of Capital Formation

A. Comment on the Four Sources.

For Viet-Nam, as for other nations, there are four sources of funds available for capital formation required for underwriting a development programme - viz., (a) Bank credit creation, (b) taxation, (c) private domestic capital formation, (d) foreign grants and borrowing. The last three of these sources, (b), (c), (d) are "savings" not essentially related to additions to the money supply, although in certain circumstances they might entail them. The first source (a) by definition adds to the money supply and is not a "savings". The same gamut of policies and techniques for maximizing investment and compressing consumption is applicable to sources (b) taxation, (c) private domestic investment and (d) external borrowing. These resources are part of a common system and there are interconnecting flows between them. Increasing one of these reservoirs by incentives or decentives may empty another. Fiscal and monetary policy should be applied jointly on all these three fronts.

B. Fiscal Measures for Maximizing the share of Output available for Investment and Directing it to desirable Sectors.

The Mission recommends the concept of fiscal incentives and decentives for maximizing capital formation. The objective is to maximize total capital formation - public and private, on a consolidated basis and to direct it to the most desirable sectors. The impact on foreign borrowing will be more one of relative desirability of direction. While fiscal policy can change the proportions of domestic output consumed or invested, foreign borrowing is already by definition a resource saved for the recipient, Viet-Nam. The product of taxation, if devoted to investment, is one form of capital formation. The Mission, however, does not necessarily recommend a tax policy which would result in a maximum yield to the State if by doing so it decreased properly directed private capital formation more than proportionately. The reverse of course also holds. What particular combination of tax features would yield such an optimum result, the Mission is not in a position to determine. Further expertise will be required; but the objective is endorsed. With these criteria in mind, the Mission draws the attention of Viet-Nam to the following type of fiscal policy and taxation which should be conducive to fostering capital formation in Viet-Nam. As a general principle, taxation for curtailing consumption and increasing investment rather for income redistribution is endorsed .

Decentive Taxation

- (a) Taxes on expenditure such as consumption taxes, already part of the pattern, could be expanded rather than dismantled in favour of larger income taxes (Expansion of latter has been a recent tax trend in underdeveloped areas).
- (b) Further emphasis on duties and excise taxes on luxuries.
- (c) Progressive rather than proportionate real estate taxes on luxury type urban construction, residential and commercial. Elimination of present exemption on new construction, except for low-cost housing.
- (d) Special taxation on idle land calculated to bring it back into production.

Incentive Taxation

- (a) Tax concessions on new domestic or foreign investment (to promote new undertakings).
- (b) Income tax relief in respect to income specifically reinvested.
- (c) Accelerated depreciation rates on new capital equipment.

As a fiscal measure to cut back consumption and attract savings to be allocated for desired investment, the Treasury might wish to give consideration to the sale of bonds to the public with attractive lottery features (Bonds not to be sold to commercial banking system or purchased by public with Bank credit, which would have inflationary implications).

Such a tax system, adroitly dosed, is susceptible of altering the ratio of output directed to desirable investment.

C. Monetary Measures and Credit Creation.

The Quantity of Credit.

Whereas external loans and grants and domestic capital formation and taxation yield resources which on balance should not increase the money supply, credit creation does exactly that by definition. Experience in other underdeveloped areas has shown that the offsetting impact on prices of new output which the created credit is to foster sharply lags timewise the creation of the new credit; moreover, in a developing country new ventures do not always succeed with the result that new money is added to the supply without a concomitant flow of output coming to market. In a more general way, injection of credit increases output only slowly while increased money income inflates the price level. The Mission therefore recommends to Viet-Nam a most circumspect policy on this score. It is suggested that:-

- (a) Development Corporations (Fonds National d'Investissements, for example) and Agricultural Banks (Office du Credit Agricole Populaire) be disbarred from receiving funds from the Central Bank or the Commercial Banking System. Agricultural or Artisanal Banks should be barred from making loans for consumption, except on a modest scale and with due safeguards. Advances should only be extended in connexion with operations contributing to output.

(b) The Commercial Banking System confine itself, as it has done historically, to short-term self-liquidating loans although it should properly give greater emphasis to domestic as compared to foreign trade and industry.

The National Bank should avail itself of its kit of tools to control the overall volume of Bank credit. While in the Mission's opinion open market operations as an instrument of Central Bank action will not be effective or available in Viet-Nam for an indefinite future, upward manipulation of the reserve requirement ratio should have an effective curbing effect in periods of undue credit expansion.

The Direction of Credit

The National Bank should encourage use of credit by the Commercial Banking System for desirable productive activities. A variety of methods may serve this purpose. The Mission suggests that a study be made of the propriety of the following techniques for directing the credit flow of the commercial banks - portfolio ceilings on a selective basis, capital ratios on a selective basis, margin requirements on letters of credit, eligibility of specific credits instruments as a component of reserve requirements, supplementary reserve requirements on a selective basis and selectivity of rediscount rates. Some or all of these techniques should assist the Central Bank into cajoling credit into appropriate investment areas, thwarting credit from supporting less desirable activities.

I also suggest that the Commercial Banking System proper, in order to maximize savings, might consider attaching a lottery feature to savings accounts.

D. Loans and Grants - External Savings

In the light of the importance of this resource to the Vietnamese economy, the Mission believes a careful analysis of its meaning and appropriate allocation will serve the cause of a development programme in Viet-Nam.

It must first of all be emphasized that there can be only one external aid, one real addition to resources. The so-called Counterpart Fund is but an internal reflection of external assistance and considering the issue in terms of foreign exchange resources and of internal resources (Counterpart Fund) as representing a cumulative contribution must be resolutely resisted. This approach is of course equally valid for all "foreign borrowing" as a source of capital funds.

A much discussed topic in respect to Viet-Nam's external aid is whether it should take the form of consumer or of capital goods. The former, it is generally implied, does not add to capital formation whereas the latter does. Such a result is by no means automatic. Foreign aid or borrowing is, admittedly, an added resource capping domestic output. In this sense only is it a contribution of capital. However, this contribution may allow the recipient country to reallocate its previous division of domestic output between consumption and investment.

- (1) If the external resource takes the shape of consumer goods and there is no reallocation of internal output, foreign aid is not capital forming.
- (2) If external aid takes the shape of producers goods and there is no reallocation of internal output, it is capital forming.
- (3) If the external resource takes the shape of consumer goods and internal output is reallocated in favour of domestic investment by a greater amount, external aid, even though it takes the shape of consumer goods, is capital forming.
- (4) If the foreign aid takes the shape of producers goods and internal output is reallocated in favour of consumption in a greater amount, such aid, even though it takes the shape of producers goods, is not capital forming.

Thus, neither the fact of foreign aid itself nor its embodiment in equipment goods leads to automatic capital formation. It is the recipient country, Viet-Nam, which must decide whether in fact aid is to lead to capital formation.

The Mission makes the following suggestions :-

(a) The present dispensation.

In the absence of National Accounts Data, a full statement is not feasible. However, this presumptively is what is happening. Bulk of aid is taking the shape of consumption goods. Although it is taking this form, it is not in itself proof that it is not contributing to some capital formation. It is raising the standard of consumption of the people of Viet-Nam, largely in practice the Armed Forces. This consumer goods import programme does not add to the money supply because it tends to be financed through self-liquidating Bank loans.

(b) A new emphasis.

Arrangements should be made for a careful increase in the magnitude of equipment and producers goods items in the import programme. This will tend to decrease consumption levels internally. Fiscal and monetary policies should be directed at curbing increasing domestic output for consumption at the expense of domestic capital formation. Steps expanding the share of capital goods in the import programme should, however, be carefully taken and gradually. The absorptive capacity and the technical skills available in Viet-Nam will have to be adequate for the task. Moreover, the financing of capital goods imports, involving plant erection, is likely to develop bank credit creation less readily self-liquidating than in the case of consumer goods imports. Careful consideration should be given to financing this expansion with non inflationary resources. A highly operational reason why a programme of this kind can only be developed slowly is that effective demand for imports of this kind will not be swiftly forthcoming from the private sector of the Economy.

UNITED NATIONS ECONOMIC SURVEY MISSION TO VIET-NAM

INTERIM REPORT BY MAX LACROIX
ON STATISTICS

1. The terms of reference of the statistical adviser of the Mission were defined by the Technical Assistance Administration, after consultation with the United Nations Statistical Office, in the following manner :

(a) To survey the statistical services of the Government of Viet-Nam and other public services and entities, and the statistical data compiled by them.

(b) To facilitate the access to existing statistical data to the members of the Mission, and facilitate the use of these data by the Mission.

(c) To formulate long-term plans for the development and improvement of the statistical services of the Republic of Viet-Nam.

2. Before an account of the progress achieved under each of these three headings is presented, a brief reference will be made to the statistical adviser's participation in the work preparatory to the Mission's activities.

PARTICIPATION IN THE PREPARATIONS FOR THE MISSION

3. In addition to attending the briefing sessions held for the Mission at the United Nations in New York, at the FAO Regional Office in Bangkok and at the French Foreign Office in Paris, the statistical adviser held consultations with competent officials of several organizations including the International Co-operation Administration of the United States, the French Central Statistical Office, the Statistics Division of the French Ministry for Overseas Territories, the Statistical Institute of the University of Paris, the School of Statistics of the French Government, the Food and Agriculture Organization (Divisions of Statistics, of Forests, of Fisheries and their Technical Assistance units), the Regional Office of FAO at Bangkok and the secretariat of ECAFE.

4. These consultations provided valuable background information on the historical development of the statistical services of Viet-Nam, on their present organization, on the quality of existing statistical series and on the principal gaps presented by these series.

SURVEY OF EXISTING STATISTICAL SERVICES
AND STATISTICAL DATA

5. During the first days of the Mission's stay at Saigon, three decisions were taken in agreement with the Director of the Central Statistical Office of Viet-Nam, the Director-General of the Plan and the Chief of the Mission, in order to make the proposed survey of existing statistical services and statistical data systematic and realistic.
6. First, information was collected on the organization of the Central Statistical Office (Institut de la Statistique et des Etudes economiques du Viet-Nam), including the previous training of its staff, their civil service classification and remuneration, and on the existing plans for the extension of the Office at Saigon and in the provinces.
7. Secondly, a circular was drafted requesting all Secretaries of State and heads of Government entities to supply specified information on the statistical series compiled by each major division of the ministries or by the various entities. This information included the size of the staff used. The circular was issued by the Secretary of State to the Presidency of the Republic ; it requested that replies be sent to the Director of the Central Statistical Office. This was in conformity with the technical co-ordinating function of that office. It is hoped that it will be possible to compile a useful directory of the Statistical Services of the Republic of Viet-Nam, such as, for example, the one prepared in the Philippines in 1954.
8. Thirdly, the statistical adviser undertook a systematic series of visits in the provinces in order to learn how the principal series of data were collected and centralized, from the Villages (this word designates an administrative unit), up to the Districts, Provinces and the three major administrative Regions into which the Republic is divided. In all, seven Provinces out of thirty-six were visited, and in each Province, one or two Districts and three to five Villages. Three of these Provinces were located in the Southern Region, two in the Central Region and two in the Mountain Region. As there are variations in the administrative organization of the different Regions, a selection of Provinces in each of the three Regions was desirable. In each Province, meetings were held with the Chief of Province and with those heads of provincial services concerned with statistics. Meetings were also held with the chief of each District visited, who accompanied the United Nations adviser to the selected Villages, where the Chiefs of Village and elected notables or appointed administrators were interviewed during sessions lasting from thirty minutes to two hours.

9. These field visits achieved their purpose thanks to the excellent co-operation extended by all local officials and notables visited. They were all the more useful in that no up-to-date information seemed to be available at Saigon on the processes actually used at present for collecting basic statistical information in the field. This situation is the rather natural result of the long disruption of communications due to the civil war and of the risks involved in travelling about the country until very recently and even now in some areas.

10. It ought, finally, to be mentioned here that the following three working parties, set up jointly by the Vietnamese administration and the United States Operations Mission, have activities with a direct or indirect incidence on the production of important statistical data :

- (a) Economic resources working party (see hereafter);
- (b) Foreign exchange working party, which should produce statistics of the balance of payments in the course of its work;
- (c) Taxation working party, concerned with fiscal data.

11. The economic resources working party, created around May 1955 and placed under the chairmanship of the Governor of the National Bank of Viet-Nam, assigned itself as its first major task to make, before the end of 1955, the first estimation of the country's national income. The process of evaluation included, inter alia, an inquiry into the sources and amount of income, and into the expenditures, of seventy-two rural families selected in various parts of the country, not at random but for reasons of administrative convenience. Upon an express request, some advice was given by the Mission's statistical adviser on the design of the questionnaire used for that inquiry; it was very well received by both sides of the working party, as it facilitated a synthesis of their contributions to the drafting of the questionnaire. On that occasion, explicit reservations were made by the Mission's statistician regarding the method of inquiry. More broadly, it was pointed out that whilst the national accounts provided convenient concepts for analyzing problems of economic development and planning, unreliable and misleading figures were likely to be entered in the accounts of countries where good basic statistics are not available. It was recalled that this difficulty had been recognized in the working documents of the ECAFE Working Party on Economic Development which met in Bangkok as recently as November 1955. In such cases, it would probably be more fruitful for purposes of economic analysis to use in the accounts sets of reasonable working numerical

hypotheses, recognized and stated as such, and work out the consequences of the hypotheses. Meanwhile, exercises in national income valuation could be made with advantage for training and statistical development purposes. These exercises would also make it possible to gradually narrow the range of the sets of working hypotheses, and make them more realistic step by step. Among other possible statistical activities of the group in the near future, labour statistics and statistical organization have been unofficially mentioned.

12. The position was taken that the statistical subjects coming under the terms of reference of the three working parties mentioned above seemed sufficiently covered by the activities of these groups, and that the limited time and resources available to the Mission's statistical adviser would better be devoted to other fields, except that information on the statistical activities of the working parties would be sought for inclusion in the Mission's report. In the case of the working party on foreign exchange, it should also be noted that its subject falls within the special competence of the International Monetary Fund.

STATISTICAL SERVICES RENDERED TO THE MISSION

13. Efforts to facilitate the use of statistics by the members of the Mission were greatly helped by the co-operation extended to the statistical adviser by all the Mission's experts, by the United States and French economic aid missions and by the officials of various ministries and departments concerned, in particular the Central Statistical Office of Viet-Nam.

14. From the outset, it was informally agreed within the Mission that direct access by each expert to data of interest to him should be encouraged, the statistical adviser being available to point out existing sources of information or, in their absence and if necessary, to facilitate contacts with Vietnamese officials, and, if required to do so, to help in utilizing the data. It was likewise agreed that any data or estimates of general interest found by the members of the Mission in the course of their work would be made available to the statistical adviser and circulated by him within the Mission so as to insure uniformity in the statistical data or estimates used by all the experts. Both arrangements have so far worked out very well.

15. During the first week of the Mission at Saigon, a meeting of all experts took place at the Central Statistical Office for a double purpose : first, to acquaint the experts with available sources of data (yearbook, bulletins, etc.), secondly, to introduce them to the director and staff of the Central Statistical Office and facilitate further direct contacts. The library of the Statistical Office was made available to the Mission staff. A set of the latest statistical Yearbook and current year's Statistical Bulletins and Economic Bulletins of Viet-Nam was made available in each office-room occupied by the Mission's experts.

16. Among the statistical services rendered to the Mission was circulation of memoranda bearing on area and population, demography and health of the Mountain Region, food balance of Indo-China, U.S. economic aid to Viet-Nam, French economic aid, and economically active population.

17. Shortly after its arrival, the Mission was confronted with three sets of estimates for the population of the Republic of Viet-Nam, differing from one another by as much as ten per cent. On the initiative of the statistical adviser, interdepartmental meetings have been held with a view to arriving either at estimates agreed to by all departments concerned or at an agreed pair of lower and upper estimates. There are reasons for hoping that this aim will be achieved, and that the Mission and the Vietnamese administration will be provided with a table showing agreed estimates of the 1955 population of each province (with figures shown for cities), in time for the preparation of the Mission's final report. Consideration will be given to the possibility of presenting these data in the form of a population map of the Republic of Viet-Nam.

PLANS FOR THE IMPROVEMENT OF THE STATISTICAL SERVICES OF VIET-NAM

18. In this interim report, it is too early to formulate plans for the improvement of the statistical services of Viet-Nam. Many important consultations on that subject have still to take place. For example, with the concurrence of the two Governments concerned, a meeting has been scheduled at the beginning of January 1956 between the Mission's statistical adviser and the FAO adviser on agricultural statistics in the nearby Kingdom of Cambodia. The purpose of the meeting is to discuss informally the conditions of a practicable plan for the improvement of statistics of cultivated areas and crop

production in Viet-Nam. The following analysis of the present situation, and the brief outline of measures likely to be recommended for improving that situation, are therefore quite tentative. They may be seriously modified before a final report is presented.

19. From the point of view of statistical organization and information, Viet-Nam is not a country starting from nought. It possesses since 1950 a Central Statistical Office (Institut de la Statistique et des Etudes économiques du Viet-Nam), headed by a senior civil servant, with a number of qualified statisticians, assistant statisticians and clerks. Several staff members were trained abroad during the years of strife, when the current activities of the Statistical Office were per force reduced, an evidence of laudable foresight. The Office is very small, its total staff numbering only sixteen. It collects in the field certain statistical data, such as prices and elements of cost-of-living indices. Mostly, it uses statistics collected by various ministries. It has experience in putting out statistical publications, as it issues a Yearbook, an annual economic survey and two monthly bulletins (statistical and economic). Meritorious efforts at collecting statistical data are made in the Villages, and centralizations are effected by the offices of the chiefs of Districts and of Provinces, and at the national level, by various ministries and entities such as the National Bank, the Railways, the Planters Union. The Central Statistical Office has working relationships with the ministries and entities collecting the more important series of data.

20. In spite of these noteworthy positive elements, it is commonly stated by the potential users of statistical data, Vietnamese and alien alike, and it is recognized by the statisticians, that the available data present grievous gaps and imperfections. Some of these criticisms are subject to qualifications as they emanate from persons who are not well experienced in the utilization of quantitative data, and have hopes of finding in the statistical publications the ready answers to their analytical problems, a situation nowhere to be found in the world. However, the criticisms are mainly justified. Comprehensive reliable statistics are actually lacking on the most basic demographic, economic and social topics.

21. This situation is in part due to the absence of safe and regular communications between the capital and most parts of the country during the war years. It cannot be completely remedied until normal channels are re-established between Saigon and all areas of the Republic's territory. However, the safety of communications has progressively improved during

the last twelve months, so that it is not untimely to address oneself now to the other conditions required for an improvement of the statistical services of Viet-Nam.

22. The principal points calling for improvement in the statistics of Viet-Nam appear to be the following :

A. Basic demographic data should be provided by a population census. It is recognized by Vietnamese officials that this operation cannot take place earlier than 1957. Meanwhile the results of certain administrative enumerations, which took place in 1955, might perhaps be checked and processed, on a sample basis, to improve existing estimates of the total population and provide, for the first time, data on the sex and age distribution of the population and on its economic characteristics. In any case, it is not too early to begin the preparation of a 1957 census. The desirable improvement of the existing vital registration system in the rural areas is a longer-term problem.

B. Since the Republic of Viet-Nam is almost exclusively an agricultural country, statistics of land use, crop production, livestock and forests rank first in importance among economic data. Consideration should be given for a plan to replace the eye estimates which are the basis of statistics available at present by measurements. Rice yields used to be regularly measured on selected plots before 1939 and this process is still carried on by the chief of agricultural services of some provinces. But a great effort is required to obtain reliable overall data.

C. There is much uncertainty about the size of the labour force, and about unemployment and underemployment. A manpower survey would provide answers to many questions arising in the formulation of economic development plans and in the implementation of such plans.

D. An effort is required to provide comprehensive overall industrial statistics giving, for instance, in each branch of activity the existing capacity and the current production, etc. A similar effort is needed to throw light on the much debated question of distribution and proliferation of commercial intermediaries.

E. Whilst current data are available on the activities of the public health services in the country, there exist hardly any data on the state of the health of the nation. A systematic inquiry, on a sample basis, could provide for the first time information on the incidence of the principal diseases in the various types of areas, and on the principal causes of deaths.

23. In order to create sufficient means for a substantial improvement of the statistics of Viet-Nam, concerted efforts would be required in the following directions :

A. Basic legislation. A review of the existing texts is required in order to clarify and strengthen the functions and co-ordinating jurisdiction of the Central Statistical Office, guarantee the confidential nature of the documents used in certain inquiries, etc. It is a subject open to further consideration whether or not the functions of the Office in the field of economic studies might not advantageously be relinquished and consolidated with the research activities of the National Bank, whilst national income estimation which seems to be considered a responsibility of the Bank would be undertaken by the Central Statistical Office.

B. It would be advantageous to have at the Government level a Statistical Board comprising Secretaries of State with major statistical responsibilities (Economy, Finance, Interior, Labour, Agriculture, Bank Governor), to facilitate the taking of concerted inter-departmental decision by the Cabinet. The Board could establish working committees of officials to consider the details of certain statistical operations of interest to several departments, in particular the preparation of a population census. The Director of the Central Statistical Office should be Secretary of the Board and he or his representative Rapporteur of the working committees.

C. The working relationships of the Statistical Office with the various ministries and government entities should be systematized, extended and strengthened.

D. The content of the publications of the Central Statistical Office should be reviewed, and avoidable duplications eliminated, in particular those presented by the Economic Bulletin and the Statistical Bulletin. An effort should be made to issue as soon as possible the Yearbook for 1955 which will show, for the first time, data relating to the present territory of the country.

E. Much of the painstaking processes of data collection and centralization taking place in the Villages, Districts and Provinces are too formal to be of real value from the statistical point of view. Sometimes those processes are repeated too frequently. Advice and guidance to local officials are required to effect an improvement of this situation, which might be a spectacular one. This requires the creation of field bureaus of the Central Statistical Office.

F. The staff of the Central Statistical Office will require a very considerable expansion at Saigon and in the provinces. The Office will need larger premises and more equipment. The training of a sizeable number of statisticians, assistant-statisticians and clerks is an immediate problem. The recruitment of staff should be facilitated by the fact that civil service salaries are competitive with those of private firms, except in the highest grades if compared with top executives in trade and industry. It should also be facilitated by the availability of persons with a good secondary and even higher education, on the French levels.

G. Better comprehension of the role of statistics should be promoted in the Government, the administration and the educated public. The creation of a professional association might be advisable for that purpose.

24. It is through the Vietnamese administration's own efforts that the statistical services of the country can mostly be improved. The notable intellectual abilities found in Viet-Nam make it feasible for the administration to undertake that task with chances of success. The useful role of alien advisers can remain a modest one, of a catalytic nature. However, substantial foreign contributions to the technical training of selected staff can accelerate the process and achieve a gain of many valuable years.

25. The revised request for United Nations technical assistance in the field of statistics for 1956 calls for advisers in agricultural statistics, manpower statistics and industrial and distribution statistics. This request is in accordance with the programme outlined in paragraph 22, sub-paragraphs B, C and D above. It represents reasonable estimated needs, which had to be formulated by 31 December 1955 for administrative reasons. It is clear that the exact priorities and emphasis to be placed on certain types of technical specialties cannot be determined before a more definitive plan for the improvement of statistics in Viet-Nam has been formulated in further consultation with the administration of that country.

UNITED NATIONS ECONOMIC SURVEY MISSION TO VIET-NAM

Final report by Cecil Miles, FAO Fisheries Officer for Asia and
the Far East

(January 1956)

CHAPTER VII - THE FISHERIES

1. EVALUATION OF THE FISHERY RESOURCES

Although the nutritional pattern of the whole of South and East Asia appears to be showing a long-term tendency towards a change in the traditional food habits, it is still true that fish is still, after rice, the most important item of diet in vast areas of the region. Even so, the quantities available in Viet-Nam are far below those required for a properly balanced diet and the price is high in comparison with the average per capita income.

It is only recently that the Government of Viet-Nam, in common with other countries of the Indo-Pacific area, has given attention to the rational development of the fisheries as a potential source of increased food production. It may be said, however, that even the task of evaluating the fisheries as a preliminary step towards development, still remains to be accomplished.

While many of the primitive types of gear in use are extremely ~~efficient~~, fish production in general is restrained by certain defects which are characteristic of the fishery industries of South-East Asia, e.g. lack of scientific knowledge of the whereabouts and behaviour of the fish and of the most efficient methods of catching species other than those available to the existing types of gear, lack of the basic knowledge governing the maintenance or increase of fish stocks and of their culture in inland waters, lack of handling, holding, processing and transport facilities, of technological improvements in craft and gear and of adequate organization of production and marketing.

This means that too little fish is caught at too great a cost in ^{and} fishing effort, that, while in general there is too little fish, temporary local gluts may occur resulting in spoilage or in an uneconomic return to the fishermen.

As a result of these conditions, the fishermen remain at an extremely low social and economic status and show a chronic indifference, or even resistance to change and hence lack the initiative and financial resources necessary for improvement.

All these factors lead to the conclusion that it should be the concern of government to bring about the conditions which will lead to the better exploitation of the fisheries and to the improvement of the living standards of those who exploit them.

The Mission has been greatly assisted in its task by the valuable information provided by the very few existing fisheries officers, and especially by Mr. Tran-van-Tri, Inspector of Fisheries of the Ministry of Public Works, but owing to the lack of even approximate statistics, only rough estimates are available as to the actual tonnage involved. Fish landings from all sources prior to World War II for what was then French Indochina have been assessed at between 260,000 and 410,000 tons (FAO Yearbook of Fishery Statistics), whereas the annual consumption for Viet-Nam was believed by Tran-van-Tri and Gaillard (1954) to have fallen from 180,000 tons in 1945 to 30,000 tons in 1953 owing to the severe restrictions imposed on fishing operations by the security measures adopted during the civil war. It is possible, however, that none of these figures are strictly comparable. Again, the lack of statistics makes it impossible to arrive at any conclusions as to the effect on the fish stocks of this period of enforced conservation.

*Charlton =
franklin, drifter*

2. THE FISHERIES ADMINISTRATION

What has been stated in respect of other activities to the effect that the development of any plan will be of little value so long as there is no proper administrative structure to carry it out and no properly trained scientific and technical workers for the necessary preliminary investigations, is especially applicable to fisheries.

The present government Sea Fisheries Service came into existence only in 1953 and is attached to the Direction of Navigation of the Ministry of Public Works. While the Inland Fisheries Service was preceded by the Fish Culture Service, which was since 1933 attached to the Institut de Recherches Agronomiques et Forestieres at Phnom-Penh, the present Direction des Eaux et Forets was only revived in Viet-Nam in December 1952, Its precarious existence has depended almost entirely on funds generously provided by the United States Operations Mission, of which the continued supply is problematical.

Unlike other government services, there was no existing administrative structure inherited from the French regime; Hence, the proper development of the fisheries by the Government of Viet-Nam does not merely involve the expansion of an existing arrangement, but rather the creation of a whole new range of activities. ~~Now~~ , Both services suffer from serious defects, not the least of which is the almost complete lack of trained personnel and financial resources to undertake the urgently required investigations in respect of the present status of the industries, the problems which confront them and the means for their solution.

This is in no way a reflection on the small nucleus of government officials who have been assigned the difficult task of organizing a government fisheries programme in the face of such severe handicaps, who have already been

in touch over a period of years with international developments and who have received short-term training abroad under FAO or American fellowship programmes and, at the national level, at the Oceanographic Institute at Nha Trang.

It will, however, be essential to supplement this skeleton administrative staff with properly trained assistants and to recognize that the complex nature of fisheries investigations (which are divisible into many highly specialized fields) demands the creation of careers designed to be attractive to professional personnel of high calibre; in particular, it is necessary to depart from the criterion often adopted that any junior civil servant can temporarily become a fisheries administrator and neither is it feasible to assign responsibility for fisheries matters to officers whose main activities lie in a different field, e.g. forestry. One unfortunate effect of this policy has been that officers who have at some expense received partial training in fisheries under one or other of the technical assistance programmes have subsequently been transferred to unrelated services.

Assuming the adoption of these basic requirements, it is further strongly recommended that the fisheries administration be consolidated under one Ministry and that it should have the status of a "Direction" rather than of a "Service" subordinated to other unrelated activities.

Advantage might well be taken of the necessity to arrange for the transfer of the responsibilities of the regional governors to the central authorities, effective as from January 1956, to constitute a more effective fisheries agency.

One of several possible organizational forms which suggests different activities requiring government attention, would be the following:

SECRETARE D'ETAT

Direction de
Pêches

Direction de
.....

Direction de
.....

Directeur Ad-
joint

Service d'eaux continentales

- 1. Biologie (écologie, comportement, reproduction, migrations, peuplements, effet des barrages, dans les cours d'eaux)
- 2. Pisciculture (poissons autochthons, poissons exotiques, fertilité des eaux, acidité, alimentation artificielle, control d'ennemis, prédateurs, rizipisciculture)

Service de biologie marine

- 1. Vertébrés, écologie, comportement, reproduction, croissance, mortalité naturelle, mortalité de pêche, migration invertébrés, (nacre, trépangs, calmar etc.), océanographie, météorologie, algues, plantes aqua-

(Note. Much of this work might be performed from the Oceanographic Institute at Nha Trang but the administration should be based on Saigon)

Bureau d'exploitation

- 1. Bateaux de pêche (coques, moteurs)
- 2. Engins de pêche (filets, lignes, madragues, nasses, fibres naturelles et synthétiques)
- 3. Contrats d'exploitation à l'extérieure (et enseignement pêcheurs nationaux)

Bureau de distribution et économie

- 1. Commerce, marchés,
- 2. Finances, crédits
- 3. Co-opératifs

Bureau de transformation

- | | |
|-------------------------------|--|
| 1. Poisson séché salé | 6. Conservation en froid - glace |
| 2. Saumures (mam, nuoc-mam) | 7. Engrais de poisson |
| 3. Farines de poisson | 8. Huiles de poissons, huiles de foie |
| 4. Conserves en boîtes (tuel) | 9. Vessies, nageoires, autres produits |
| 5. Chimie, bactériologie | |

...../...

Bureau de bio-statistique

1. Débarquements, analysés par espèces
 2. Commerce interne
 3. Commerce avec l'étranger
 4. Censement de bateaux, engins (facteur effort)
 5. Sondage (pêche professionnelle, artisanale)
 6. Peuplements, fluctuations, classes annuelles
- (Note. The gross statistics would presumably be carried by the Statistical Department with which the Service de Biostatistiques, would work in close liaison)

Bureau de réglementation

Bureaux provinciaux

Bureaux dans les provinces - liaison avec tous les autres services, peut être sous le directeur adjoint

Bureau d'Administration

(Note. It is recommended that hunting and wildlife should not at present be attached to the fisheries administration).

It is to be repeated that the above services and bureaux must be staffed by men who, after proper academic training (which should commence as soon as possible) are willing to spend considerable periods of time in close contact with the operatives.

While it is perhaps beyond the competence of the Mission to advise as to which Ministry the Direction of Fisheries should be attached, it is thought that its guidance may be valuable in arriving at a decision. There is no strict uniformity in other countries as to the Ministry dealing with fisheries, although the tendency is to attach them to Agriculture; there may however be special reasons why they should depend on a Ministry of Economy or Industries; there is little reason to attach them to a Ministry of Public Works on the grounds that one of the implements used for catching fish is the fishing vessel.

Consideration should be given to the means by which the Oceanographic Institute at Nha Trang, at present in abeyance, may be put to the best use.

This Institute, which is at present under the Ministry of Education, performed extremely valuable work in past years in the field of marine biology, in exploratory fishing and in the processing of fisheries products. Prior to World War II the Institute had at its disposal a number of specialists as well as the 750 ton vessel "De Lenessan", but has recently done little real oceanographic work.

The premises in which the Institute functions are exceptionally spacious and its geographic location is extremely favourable for marine research although the necessary equipment has not been replaced after the destruction wrought during the Japanese occupation, and the research workers are lacking. The numerous valuable publications produced by the Institute in past years, which are insufficiently known in Viet-Nam or abroad, should form the point of departure for future biological investigations. While the Government may not consider it realistic, in the present economic circumstances of the country, to aspire to develop a merely academic institution such as was envisaged by the French administration, it is nevertheless believed that the Institute should be rehabilitated and its work oriented towards practical investigations, for which purpose it should be closely linked with the Direction des Peches. Much of the research work of the Direction could, in fact, be better performed at the Nha Trang Institute than in a centre such as Saigon. In any case, Direction des Peches should, through its competent trained personnel, have sufficient professional status to indicate a programme of practical research.

The functions of the fisheries administration, which are at present being only partly performed, are, as the Mission sees it:

(a) to bring to bear on the fisheries a rational approach not available to the operative because of his lack of formal "education",

(b) based on the resulting understanding of the industry, to define the problems and inherent defects which restrain it,

(c) to seek solutions to those problems, and,

(d) insofar as may be possible, to place in movement the measures necessary to bring about the solutions.

3. TAXATION

Experience has shown that the fisheries officer should be divorced, in so far as is possible, from police functions, from the enforcement of regulations, and, above all, from the collecting of taxes; and that he should, on the contrary, be the friend and confidant of the fisherman. The framing of the laws relating to taxation of the fishing industries should, nevertheless be achieved in consultation with the Director of Fisheries who should logically be the most competent authority in the country to advise the government on the technical, social and economic considerations.

The basic principles involved and the necessity for government to provide itself with funds is, of course, outside the scope of this chapter. It is, however, perhaps not out of place here to record the fact that the fishing industries are, in Viet-Nam, rather heavily taxed and that, while not discussing the expediency of leaving untouched an existing and accepted tax structure, the Mission believes that consideration might be given to the lightening of this burden so soon as may be practically possible, especially in respect of those activities which are at present subject to double or even triple taxation.

It might even be argued that the existing situation is to some degree anomalous in so far that the fisheries are considered to warrant subvention from foreign sources while at the national level they continue to constitute

an important source of revenue.

4. COST OF THE FISHERIES PROGRAMME

The above mentioned revenue derived both directly from the fishing operatives and indirectly from taxes on sales, on salt used for preservation, etc. is probably in excess of 200 million piastres annually and it would seem to be merely good business practice to plough back a substantial proportion of this revenue for the benefit of the industry.

5. THE PRIMARY INDUSTRY - CAPTURE AND CULTURE OPERATIONS

It may be reasonably argued that, while the organization of a competent fisheries authority, the training of fishery biologists and technicians and the development of a programme of investigation will take several years, it is the government's immediate aim to take measures for the rehabilitation of the economy and the Mission will therefore endeavour in the following section to develop such recommendations as may be practicable to this end, although the short time at its disposal was quite inadequate for the framing of a comprehensive programme of fisheries development which should necessarily be based on more exhaustive and specialized study.

This does not, however, vitiate the over-riding consideration that the proper implementation of any plan and its continued development must in the long run depend on the efforts of competent Vietnamese fishery experts and that technical assistance from outside sources is but a temporary stop-gap which is of doubtful value unless its perpetuation is guaranteed at the national level.

5.1 Freshwater fisheries - capture operations

It is well known that in the tropics the inland waters are generally extremely productive owing to the rapid turnover of the nutrient elements, whereas the clear waters of the sea are rather unproductive, a situation which is exactly the reverse of that found in temperate waters, (although it should be added that the freshwaters of South Viet-Nam tend towards high acidity). For this reason, the inland waters of tropical countries play a comparatively more important role and the importance of their scientific study was brought out by Lemasson (Bulletin Economique de l'Indochine, 1949)^{when he said} that "one cannot fix the piscicultural value of a water complex unless one knows first the needs, in respect of reproduction, feeding, etc. of the species.... It is only when

this information has been established that the improvement of the possibilities offered can be envisaged (for which) the necessary precise knowledge is at present almost entirely lacking. Its acquisition will require long years of work, but the stake is worth the trouble".

As has been previously indicated, many ingenious and effective devices have been developed by the local fishermen over long periods of time; they may, in fact, be so effective as to deplete the resource through their indiscriminate and uncontrolled use and conservation measures may require to be adopted. Such conservation measures should not, however, be arbitrarily introduced but must be based on the scientific study of the fish populations on which they bear. The ideal situation is, of course, one in which the amount of fish extracted is exactly equal to the natural increase; if it is more, depletion will occur and if it is less the resource is not being fully utilized. Such faunistic studies are a special branch of fisheries science with which the Vietnamese fishery authorities must become fully conversant since they alone can establish the contacts necessary for an exhaustive local knowledge of the fishes inhabiting the water masses, through hard work both in the field and the laboratory. Capture methods must also be studied since these, however effective, are always subject to improvement of materials or design or the adaptation of methods in use in other areas.

River barrages

The increasing tendency to utilize to the full hydro-electric power and to erect barrages across water courses for irrigation, flood control and other purposes makes it especially necessary that fisheries scientists concerned with the continental waters should be in a position to give their expert advice as to the possible effect on the fish stocks (whether or not

migrations occur) and the best methods whereby the harmful effects may be reduced to a minimum. The knowledge of the fish fauna is at present quite inadequate to enable fisheries agencies to give such advice. It is, however, the responsibility of the hydraulic engineers in the overall interests of the public economy, to communicate their water control programmes, at the earliest stage of planning, to the fishery authority. The latter, in its turn, should not await the development of specific projects to familiarize itself with the behaviour of the fauna of the various river systems and with the existing literature relating to the minimization of the effects of barrages, both harmful and potentially beneficial, on fish life. While it is not reasonable to expect that the hydraulic engineers should possess the biological information necessary to assess the effect of their structures on the fisheries, it is important that they should realize their limitations and avoid the unnecessary expense of incorporating devices for the passage of fish (and more especially "fish ladders") which will be completely ineffective for tropical fish fauna. It is, however, the argument of the engineers that they have been unsuccessful in their attempts to obtain such information from the fishery authorities.

It would, however, be even more deplorable for an uninformed fishery agency itself to attempt to propose solutions and until such time as it is in a position to give authoritative advice/ ^{and} it should take prompt measures at least to seek such information of a general nature as may be available from foreign experts. The Indo-Pacific Fisheries Council of FAO has made exhaustive recommendations in this respect and has contributed a chapter to the UN Manual on River Basin Development which should be carefully studied by both the public works and fishery authorities, as an extension of this

report, which is severely limited by considerations of space.

Pollution of natural waters

With increasing industrialization there is the ever present danger that irreparable damage may be caused over hundreds of kilometres through the uncontrolled discharge of factory wastes. It is therefore essential that fisheries officers should be informed as to the likely effects of such effluents and that the government departments concerned with industries should collaborate with and act upon the advice of the inland fisheries officers.

The possible pollution of the Song-Tu-Bon River some 50 kilometres upstream from Faifo where a coal washing plant is to be installed, is cited as one case which warrants immediate attention and there are no doubt others. The Indo-Pacific Fisheries Council of FAO has given considerable attention to these problems and has published much material which should constitute a sound basis for the future work of the competent Vietnamese fisheries authorities.

5.2 Culture operations

Because the science of fish culture involves different techniques from those relating to the capture of wild stock, these activities should be assigned to specially trained officers. Again, much literature is available and the experience gained by the Vietnamese fisheries officers through the Indo-Pacific Fisheries Council should prove invaluable. Fish culture in tropical waters being a highly specialized subject, the most valuable experience will be gained in the country itself through experimentation based on a scientific knowledge of the behaviour of fishes in general plus the study of the traditional methods developed in Viet-Nam and elsewhere. Training should be principally in countries of the region where flourishing

fish culture industries are established and Vietnamese officers have, in fact, attended short but hardly exhaustive courses sponsored by FAO in Indonesia and Bangkok. It is now important that they should apply the knowledge so gained to the special conditions prevailing in their own country and that the adaptability of local species to fish culture should receive preferential study before contemplating the unnecessary and possibly harmful introduction of foreign species.

Only in areas where such local species do not exist and cannot be introduced from neighbouring places will it usually be profitable to encourage the transplantation of species from abroad, and the exceptions to this rule should only be considered after exhaustive study.

The cultivation of local species of fish has existed in Viet-Nam since time immemorial and there is every reason to encourage it. There have been three principal systems - (a) the extremely profitable culture of the Chinese carps in North Viet-Nam, no longer accessible; these fishes do not spawn in captivity; (b) the culture of the Common Carp by the Thai people including that which takes place in terraced rice fields; the common carp spawns in captivity and its cultivation in South Viet-Nam might be encouraged; (c) the raising in ponds of certain local fishes, including the catfish Pangasius (ca tra), the snakehead Ophicephalus (ca bong), and Trichogaster (ca sat); this type of fish culture is common in South Viet-Nam and warrants the study of the fisheries officers in order to advise the rural population in respect of optimum density, compatible combinations, fertility of waters, feeding, mortality, etc. so as to obtain the maximum use from the available water areas.

The African cichlid perch, Tilapia mossambica (caphi), will no doubt prove to have been a valuable introduction, notwithstanding the fact that it was not preceded by the investigations which are usually advisable in such cases and such as are proceeding in India, to determine the regions into which this fish might be introduced profitably and without hazard. The experimental culture of Tilapia should continue with a view to ascertaining which parts of the country may benefit from its introduction; these are likely to be the areas where there is a lack of fish. Tilapia culture is usually most profitable as a cottage industry in combination with pig raising, provided the operator is instructed as to the necessity of weeding out the overproduction of young fish. The experiments at present being undertaken in Hawaii for the cultivation of Tilapia as live bait for tuna should be followed.

The Fisheries Service should now, however, turn its attention to other species than Tilapia, with which it has up to the present been almost exclusively concerned. There is an important industry which imports young Pangasius from the Tonle Sap in Cambodia for raising in ponds in South Vietnam. A particular feature of this system in some areas is the practice of feeding fish on raw sewage and the public health aspects of this should be considered. If it is desired to discontinue the importation of fry from Cambodia, the Fisheries Service might endeavour to obtain increased local production of species which have consumer preference; these are the air breathers such as Pangasius, Ophicephalus and others which reach the market in live condition - an advantage which the Tilapia does not possess.

It is believed that there is no reason why Vietnamese experts with the equivalent of university education should not after a few years training acquire this knowledge which, however, will only be of value when backed up with drive and initiative on their part and encouragement in their work by government; given these circumstances, Vietnamese fish culturists should be well able to develop their own techniques and for this reason possible FAO technical assistance in this field, while perhaps desirable, is not considered to warrant the highest priority. It is, however, urgent that the training of officers for the freshwater fisheries programme should commence without delay in order to fill the gaps at present existing, and fellowships should be sought from the various technical assistance sources now available for education (a) at university level for a freshwater fishery biologist (2 years), and (b) at the slightly more technical level of a fish culturist with a biological background.

Brackishwater fish culture

When considering the possibilities of the increased production of cultured fish, the extensive tracts of low lying marshland in the deltaic area of the Mekong River should be taken into consideration, especially where these are accessible from inhabited areas. An FAO expert visiting Viet-Nam in 1953 was informed that high yields of fish (principally mullet and shrimps) were being obtained from 600 hectares of marshland which had been enclosed as a result of the building of a sea wall along 15 kilometres of coastline in the area of Tan Binh Diem in the Province of Go Cong, and recommended that this development should be studied with a view to its possible extension to other areas. Considerable quantities of mullet entering the lagoons along the coastline in the proximity of Hue are caught for local consumption. In view of the scarcity of sea fish in Hue it is recommended that a special study be made of the occurrence of mullet along the coast with a view to increasing the number of fish entering the lagoons and that to this end contact be made with the competent committee of the Indo-Pacific Fisheries Council, which is at present undertaking an investigation of mullet culture.

Apart from the species above mentioned, it is known that the milkfish, Chanos chanos, exists in the waters of Viet-Nam and a systematic search for fry collecting areas would be warranted.

Fish culture in rice fields

This type of fish culture is a development of the practice of exploiting the wild stocks which normally enter the rice fields with the irrigation water. Apart from the reported use of rice fields for the culture of the common carp by the Thai people of North Viet-Nam, rice fields have not commonly been used elsewhere for this purpose, notwithstanding repeated statements to the contrary in the literature.

The chief possible disadvantages of fish culture in rice fields are the sacrifice of small areas as refuges and access canals and the fact that the rice plants are, in fact, emergent vegetation which is not generally considered to constitute a favourable milieu. It has, on the other hand, been argued that fish do, in fact, favour the growth of the rice plants and that they reduce the cost of weeding.

The fact, however, remains that the area of flooded rice fields in South Viet-Nam is of the order of millions of hectares and that their potentiality should not be neglected, both as regards the full exploitation of the wild stocks coming off the fields and the thorough and objective investigation of the profitability of formal fish culture therein. It is therefore recommended that the Government of Viet-Nam should participate in so far as may be possible in the investigations at present being undertaken by the member countries of the FAO Indo-Pacific Fisheries Council, in order to determine the advisability or otherwise of adopting a policy of fish culture extension work among rice farmers.

5.3 The sea fisheries

As in the case of the freshwater fisheries, the craft and gear used by the Vietnamese fishermen is extremely diversified and, within certain limits, effective. It has been well described in literature and government reports and will therefore not be the subject of detailed analysis here. Figure 2, however, will show pictorially the principal zones in which the main types of gear are used and the species of fish on which they bear. The fishing seasons are shown in Figure 1 (See also "Sur les ports et calendriers de peche maritime du Vietnam", Institute of Oceanography, Nha Trang, Document No.2, July 1953).

However, since the conditions prevailing at sea differ essentially from those of the inland waters, investigations should be undertaken by competent officers along the following lines:

(a) Craft

The effectiveness of existing country craft should receive careful study with a view to ascertaining the advantages and disadvantages which would accrue from changes in design and more especially from mechanized propulsion, which should not necessarily replace sail. One interesting factor which has become apparent from the unsuccessful attempt to introduce six Japanese type small drift trawlers has been that the local fishermen did not take kindly to what was, for them, a revolutionary design and this repeats the experience gained in other parts of the Far East, where the emphasis has been placed on demonstrating the effectiveness of engines installed in country type craft. Where this has been done, not only have engines come to be accepted under government subsidy schemes, but the fishermen themselves have, once they were convinced, themselves taken the initiative to mechanize, making

their own financial arrangements. This is largely a matter of mass psychology among a class of people which is traditionally conservative but not for that completely averse to change if the right strategy is adopted.

It is, however, strongly recommended that expert advice be sought as to the type and horsepower of engine which should be installed, particularly in the first demonstration trials. It will moreover, be wise to ensure that the installation of the first engines distributed on this basis of proper adaptation, is supervised by a responsible marine engineer and that the operatives are made acquainted with the necessity for proper maintenance. Especially is it recommended that care should be taken that the practice adopted in one or two cases of handing over an engine which has arrived minus the propeller and allowing the recipient to find his own, should not be repeated, as the adaptation of propellers to particular engines and particular types of boats is a highly specialized matter and failure to take the requisite precautions in this and other details might well condemn a mechanization programme to failure from the outset.

As regards changes in craft design, it will be found important at the outset to remember that the country craft, besides being a means of catching fish, is also the home of the operative from which he derives a sense of security. Another factor which undoubtedly contributed to the laying up of the six trawlers as well as of the two purse seine boats brought in under the same scheme, was the lack of facilities to demonstrate their operation, which would in any case have been difficult for so many as six vessels at one time, although this in itself might not have made them unsuccessful, as it appears that they were ordered without sufficient thought having been given to the local conditions, cost of fuel, etc.

It is believed that, if it is contemplated to give further trials to craft of a non-indigenous type, such experiments should relate to rather larger vessels with the express object of seeking fishing grounds farther afield, outside the waters at present being fished by the country craft and that, as far as the latter are concerned, efforts be concentrated on (1) gauging the acceptability and practicability of mechanization, and (2) demonstrating complementary types of gear to be fished therefrom.

In view of the fact that it will be difficult, if not impossible, to secure local crews to operate such larger boats, it will be essential, in the first place, to carry out trials by means of contracts with foreign concerns which may be willing to import capital equipment in combination with local or government capital, and to supply the crews until such time as local personnel may be trained, and it is understood that such contracts are being considered with Japanese entrepreneurs, on a similar basis to that which is in operation in India, Burma and elsewhere. One important thing to keep in mind is the necessity to ensure the recruitment of bona fide fishermen who are eager to acquire new skills, on the Vietnamese side, to which end it will be essential to work out schemes which offer sufficient real inducement in the way of remuneration proportionate to results. For this reason it will probably not be wise for government itself to undertake fishing operations, a course which is outside the tasks for which the administrative machinery is adapted and which has led to disastrous results in many countries where it has been attempted. Government might, however, when a successful modus operandi may have been found and sufficient trained crews are available, make suitable arrangements for the financing (or the underwriting of the financing by others) of such a venture on the part of a national group, co-operative or otherwise.

One encouraging activity encountered by the Mission in the field of mechanization, was the construction which is nearing completion at Cap St. Jacques by a group of local fishermen of a 15 metre craft for servicing the "Day" (bag net) fishery, in which a 45 h.p. diesel engine has already been installed entirely by their own effort. The encouragement by government of such initiative through reasonable financial arrangements to replace the exorbitant rates of interest available to them, might well pay dividends in the field of the national economy.

As regards programmes relating to fishing boats, the aspect which would best lend itself to technical assistance by FAO would be on the mechanization of country craft, providing a scheme were in operation whereby a sufficient number of suitable engines would become available and the means existed of placing them with the fishermen once successful trials had been made. FAO is already assisting the governments of Ceylon and India in this respect. With these provisos, it is thought that fairly high priority might be given by the government to such a request.

(b) Fishing gear

It has already been said that many types of fishing gear at present in use are quite effective for their purpose, and it may be added that, in general, the professional fisherman is far more familiar with the habits of the fish which he catches than it lies within the power of any outside person, national or foreign, to become.

Nonetheless, although the task of instructing the operatives in unfamiliar fishing methods must be approached with a certain humility, there is, notwithstanding in the case of the marine fisheries, a distinct field of

action which lies outside the possible knowledge of the fisherman and which relates to technological phenomena of which he is unaware. A few typical lines of innovation which might well prove to be successful are:

- (i) Demonstration of the purse seine closed by rings (ralingues) as an advance on the traditional "senne tournante" from which, it has been demonstrated, the fish often escape
- (ii) Trials of gill nets made of synthetic fibres such as nylon for the capture of threadfins (Polynemus and Eleutheronema - Vietnamese: "ca chet", French: "bar") as well as of other types of nets of the same material
- (iii) Trials of long line for tuna; long lining is carried out in Vietnam for sharks only and for this reason may not prove successful for tuna. In any case, the use of much longer lines than at present would warrant a trial, for which purpose the introduction of mechanical hauling apparatus would be necessary
- (iv) The advisability of carrying out trials with the Danish Seine might well be considered
- (v) Trials with Japanese types of trap nets - "otoshi ami" - a type of experimentation which, it is understood, is shortly to be undertaken on the tuna grounds at present exploited by the local trap nets (madraques) at Nha Trang
- (vi) In view of the great quantities of webbing which is at present made by hand, it is possible that the operatives might be enabled to spend more time at sea were ready-woven webbing made available to them at reasonable rates, either imported or, preferably, manufactured locally on small imported net weaving machines

(vii)) Further experiments with large type trawlers, in the manner above suggested.

However, the perfection of the above and other new types of gear and fishing methods can only be carried out by a properly qualified gear expert and, pending the training of Vietnamese personnel, it is suggested that the highest priority might be given by the government to requesting FAO to supply such a specialist, who should himself make the selection of the types of gear most suitable for introduction or modification after a preliminary survey.

(c) Manpower

The immediate problems relating to manpower with special reference to refugees is covered in another chapter and this section will deal with those aspects having a special relation to the fisheries.

There is no record regarding the sector of the population which earns its living principally by fishing and much less of those who engage in part-time or subsistence fishing, but this number, which was already large, has been considerably increased perhaps in greater proportion to that of other trades because of the fact that the fishing villages of the north, which were predominantly of the Roman Catholic faith, have moved southward en masse. This means that the fishing population of South Viet-Nam has within a short period of time increased by many thousands.

This situation should in itself have the effect of increasing fish landings but will also bring with it many problems. In addition to the aid which is being given to all refugees in the way of food and housing, these people have been given materials for making their boats and gear, and their great recuperative power is demonstrated by the manner in which thriving

refugee fishing communities are already in existence all along the coastline of South Viet-Nam. They are, however, still mostly lacking much material to enable them to ply their trade in such a way as to make a maximum contribution to the national economy and at the same time make themselves independent of external aid.

The fishermen of North Viet-Nam are essentially more energetic than those of the South and this, added to the fact that the existing fishing communities are themselves at a very low economic level, has already given rise to friction in some places, a circumstance which has been aggravated by religious considerations. It is possible that the eventual solution, once the immediate subsistence problem of the refugees has been attended to, will be to consider the fishing industry as a whole and to provide government assistance and guidance to all the fishing population rather than to perpetuate a policy of segregation and discrimination, integrating the fishermen located in a particular area into groups, irrespective of their origin or religion. Although such a course admittedly poses a number of difficult problems, it will also offer the opportunity to the South Viet-Nam fisherman who has traditionally been content to refrain from fishing for a time after a good catch, to learn to adopt a more energetic and productive way of life.

Attention has been called in the introduction to this chapter to the vicious circle which exists in most fishing populations in Asia, of penury, indebtedness, low per capita production, indifference, and again penury, and the raising of the social and economic status of the population must of necessity form an important part of a government fisheries programme.

There is also the danger that the increase in the number of fishermen exploiting a particular stock may result in even lower returns per unit of effort and with a corresponding risk of depletion. These situations should be examined, but again such studies form one of the newest and most specialized branches of fisheries science which demands high qualifications involving the correlation of factors relating to biology, ecology, oceanography and mathematics, and the preparation of government personnel for such a task would demand several years of post-graduate study. It is possible, therefore, that the government may wish to request FAO for a fisheries marine biologist to point the way towards the rational exploitation of the known fish stocks and the manner in which some sectors of the excess fishermen might be siphoned off into new extractive industries based on larger boats and new types of gear to exploit more distant, at present unknown, fishing grounds.

6. THE SECONDARY INDUSTRIES

6.1 Icing and cold storage

As has been previously stated, fresh fish is the most beneficial form for human consumption and the long-term goal should be in this direction, even though on a short-term basis inadequate marketing and transportation, and consumer preference, may for the time being require considerable attention being given to the various types of processed products to be dealt with later.

Icing should be encouraged both as concerns the fishermen at sea and those handling the fish on shore. To this effect the present situation as regards existing ice plants should be thoroughly studied with a view to making maximum use of them and supplementing them as necessary.

Again, it is not usually profitable for government itself to enter the ice business but rather to provide inducement for the erection of plants

by private enterprise, co-operative or otherwise, and to see to it that the ice is supplied at reasonable rates to the operatives, fishermen, carriers, and markets. Suitable inducements might be, supply of machinery on easy terms, rebates on import duties or corporate taxes over a period, etc. etc.

6.2 Cold storage

It is understood that the government already has under study the establishment of cold storage facilities at several strategic points, with a view to facilitating the marketing of future landings by government-sponsored trawling operations. The preliminary survey of the Mission, while of the briefest and most superficial character, would seem to indicate that the plans still require much serious study before proceeding with the final arrangements, in so far that at one place (Da-nang) where such a plant had been proposed, not only do excellent private facilities exist at very reasonable rates, but several large cold rooms are at present vacant subsequent to the evacuation of the French military forces which had previously rented them. It is believed that failure to make use of such existing investments of private capital will not only result in an anti-economic dispersal of effort, but be contrary to the desired object of encouraging the investment of capital, both national and foreign, in such valuable enterprises. Moreover, by using to the full such existing facilities, the limited amount of funds available to the government for these purposes can be better directed towards the erection of similar facilities in other places where a real need exists.

FAO is at present providing technical aid to advise the governments of several countries in respect of their cold storage programmes and could no doubt provide similar assistance to the Government of Viet-Nam for a short-term survey of say three months if an urgent request were made to this effect.

6.3 Salted fish

Both dry and wet salting is carried on in Viet-Nam and the processes in use have been recorded in the literature. The most urgent requirement in this field is the establishment of public health and quality standards and the study of the possibility of achieving technological improvements and perhaps more economic methods or longer storage life of the product, etc. Again, specialized knowledge is required and technical aid in this respect might be combined with that suggested in the previous paragraph. The experiments at present being carried out by other member governments of the Indo-Pacific Fisheries Council in respect of methods of dry-salting fish in humid tropical conditions should be closely followed and participated in when such action becomes possible through the development of a government programme.

6.4 Fish sauces ("nuoc-mam") and fish pastes ("mams")

The traditional fermented fish sauces so widely consumed throughout the Far East have perhaps been the subject of more technical papers (over one hundred) than any one other phase of the industry. Very high quality sauces are manufactured in Viet-Nam, especially in the island of Phu Quoc and the village of Nam-O near Da-nang (Tourane). The high standard achieved in these two places is due to the fact that they are made exclusively from the anchovy (Stolephorus) and the makers maintain a highly concentrated product - often subsequently adulterated in the centres of consumption.

The chief preoccupation of the government in respect of sauces and pastes should be insistence on quality standards through rigid inspection not only at the place of manufacture but also at the point of retailing.

Much has been written in Viet-Nam and elsewhere and experiments have been carried out to establish a quick process whereby fish sauce manufacture

may be achieved in weeks rather than months, but in view of the fact that nowhere has such a method been adopted by the industry (whether because it has not been carried to the commercial scale or because it was not successful, or because it did not satisfy consumer preference) it is thought that further experimentation along these lines should not receive preferential attention by government, at least until more urgent problems have been solved. The fish sauce industry is an extremely flourishing one (78,000,000 litres having been produced in one year in Viet-Nam alone) and is at present well able to take care of itself, although the establishment of quality controls appear to be necessary.

While a small percentage of "nuoc-mam" is made from freshwater fishes, sea fishes (especially anchovy) make a superior product.

6.5 Fish liver oils

Although large quantities of sharks are caught along the shores of Viet-Nam, they are principally exploited for their fins although the flesh is also salted and dried. The livers are either thrown away or used as bait. In view of the important vitamin content, this would appear to offer a fruitful field of investigation.

6.6 Fish meal

In view of the fact that the manufacture of fish meal for livestock is largely a matter, in Western countries, of utilizing small fish which would otherwise not find a market, whereas in Viet-Nam there is in existence a demand for such small fish both for direct consumption (fresh and salted) and for the manufacture of "nuoc-mam", it is possible that there may not be an immediate demand for the manufacture of meal, or that the small fish may not become available at a sufficiently low price. Nevertheless, experiments might

well be carried out on a pilot scale pari passu with the development of a poultry industry and at such a time the methods which have been tried in neighbouring countries should be studied before experiments are undertaken.

7. THE TERTIARY INDUSTRIES

The tertiary industries are here understood to include transportation, marketing and financing, all of which, as in other countries of the Region, are in a state of deplorable neglect.

The essential role of these activities should be to get the fish, once landed and/or processed, into the hands of the consumers (including potential consumers at present inadequately supplied) in the best possible condition and at the most economical prices while at the same time assuring an attractive remuneration for the primary producer. This in turn implies the study of the advantages of organizations such as co-operatives and other associations and of bank and loan facilities. It also involves the logistic aspects of holding fish in cold storage (as against the technological considerations dealt with in the previous sections), and with the most efficient (and least onerous) means of financing both the primary and secondary industries. The collection of fisheries statistics is particularly applicable to this phase of the industry and may be conveniently dealt with by the same government department. The functions of marketing and distribution are, in Viet-Nam as in other countries of the Far East, at present inseparable from the financing of the industry, owing to the age-old practice whereby the money lender advances money to the fishermen, not only for outfitting his actual operations but for family disasters and social and religious occasions, thereby acquiring a lien on the entire fish production at prices dictated by him. The entrepreneurs often also control the retail outlets, thus guaranteeing for themselves a virtual monopoly through both vertical and horizontal combinations.

Although the conditions thus imposed on the fishermen are often extremely burdensome because of the high rates of interest on loans and what appear to be exorbitant profits, the system is an integral part of the social structure from which it is extremely difficult to induce the apparent victim to release himself, since he is loath to wean himself from an existing quasi paternal relationship in favour of an impersonal government-sponsored financing scheme as to the permanency and beneficence of which he may not be convinced. This makes it necessary to take a broad view of the marketing and financial structure as a whole and piecemeal approaches to special problems can rarely succeed.

It must, moreover, always be kept in mind that, even though under the traditional set-up the middleman may, in fact, be taking an unduly large share of the value of the product, his very existence implies an economic function. The task of government, therefore, is not merely to get him out of business at all costs, but to replace him with a means of financing the industry which will substitute all his different activities on a truly stable basis.

While it is true that co-operative effort on the part of fishing communities might, against a western background, well perform these functions more effectively, there is the ever present danger that so-called co-operatives may not, in fact, be more than associations formed on an ad hoc basis to take advantage of government loans which may subsequently prove to be difficult to collect. There is the additional factor, that where a co-operative is inefficiently run the remedy may prove to be worse than the disease, and such failures may permanently destroy the confidence of the

fisherman and drive him back to the moneylender.

One of the principal reasons which has forced the entrepreneur to operate at high rates of profit and which has enabled him to obtain considerable control over a restricted market is the element of risk which has in the past been brought about by the irregularity and extreme perishability of fish supplies, aggravated in tropical regions by problems of climate, distance and accessibility.

Government, therefore, should first of all endeavour to eliminate the element of risk through developmental measures such as those which will evolve from a programme such as that suggested in the previous pages, after which reductions in the cost of marketing and distribution should naturally follow, concurrently with an increase in the flow of supplies arising from the creation of incentives to the primary producer to increase his output.

There is no doubt that expansion of fishing activities, which are often restrained through uneconomic marketing and financing, ^{depend} will to a large extent on the availability of cheaper capital on the production side, (e.g. by an extension of the present agricultural credit system) which may then be co-ordinated with similar measures on the marketing side which will give rise to a more competitive element.

The second and more immediately visible defect of the present marketing structure is the lack of organization and hygienic handling practices in the markets themselves. In Saigon-Cholon especially, in the absence of proper premises for the distribution of sea fish from the trucks in which it is brought from the point of production, it is merely dumped on the street in the most appalling insanitary conditions for distribution

among the retailers, who are under orders from the entrepreneur to sell it at prices fixed by him.

The retail stalls themselves offer only slightly more satisfactory conditions. There is no attempt to use ice and there are large quantities of flies. It must be stated, however, that an entirely different set of conditions exists in the case of freshwater fish, which consumer taste dictates shall be sold alive, swimming in water, which is, of course the most satisfactory situation imaginable.

It is, therefore, recommended that the Government bring fish marketing under close supervision, by introducing regulations which are capable of enforcement, and by providing the essential public utilities and services. The success of these measures will, of course, depend upon the creation of a strong Marketing Bureau staffed by properly trained officers.

Among the measures to be considered are :

- i) Provision of public utilities and services, including cold storage holding facilities;
- ii) Improved handling facilities;
- iii) Better transport facilities, especially to bring the catches from remote production centres and also to bring areas of shortage within reach of the fresh fish supplies.

The desirable goal would, of course, be the establishment of regulations demanding the holding of retail supplies in closed or glass-covered refrigerators or at least on slabs of ice and this has been achieved in some countries such as Venezuela. It is however realized that such desirable achievements may not be immediately realizable.

It was reported some time ago that "a trial of the application of the Hong Kong Fish Marketing System observed by the Vietnamese participants at the FAO Marketing Course was about to be commenced in the province of Gia-Dinh" and the results achieved should provide an interesting pilot study for application throughout the rest of Viet-Nam.

It is recommended that, concurrently with the formation of competent fish marketing officers, a survey be requested of FAO under the Expanded Technical Assistance Programme of the broad economic aspects of fish production, wholesaling and retailing, including transportation, distribution, cold storage and handling.

8. TECHNICAL ASSISTANCE

Summarizing the recommendations put forward in this chapter, the following are the principal fields in which UN technical assistance might be requested from the FAO Fisheries Division, in approximate order of priority, and for which young men of high calibre should be selected for training abroad :

One team of two experts for :

Gear technology and fishing techniques

Fishing boat mechanization

One team of two experts for :

Fish marketing and distribution (economist)

Fish processing and cold storage

One expert in Marine Fisheries Biology

One expert (eventually) for Inland Fisheries and Fish Culture.

It is also important that the training of Vietnamese experts should commence immediately and in most fields this can only be done abroad. Such

fellowships should be awarded only on the basis of high educational standards and the likelihood that the trainee will, on completion of his studies, be offered an attractive career in fisheries.

Where the training is intended to prepare the candidate to take charge of a "Service" or "Bureau" that post should be left vacant with only an acting chief until such time as the titular/incumbent is appointed after training, which may in a few cases take several years.

Care should be taken not to send candidates abroad for training merely on the basis that they might appear to deserve the post in question on grounds of expediency or because they have performed the functions at lower level, if they have not the basic capacity and a calibre to absorb the highly specialized training and the judgment to apply it.

It is believed that the persons with the necessary initiative, administrative ability and general knowledge of the fisheries to fill the posts of Director and Sub-Director (Directeur Adjoint) already exist in Viet-Nam. While they would greatly benefit from high level training abroad to complete their technical skills, their presence in Viet-Nam will be required in the first, formative years.

In view of the present shortcomings of university training in Viet-Nam, candidates for fellowships might be chosen at three levels; firstly, those required to absorb a very thorough academic knowledge to perform highly specialized work in the fields of biology or technology, whose training should be for a period of not less than two years and who should already possess the equivalent of a university background; secondly, those required to assume responsible positions but whose speciality is of a less academic nature,

for one year training periods; and thirdly, those whose work will be merely that of technicians, who may receive short-term training periods within the region.

The priorities for fellowships (bourses) will be somewhat different from those indicated above for foreign experts, as follows :

Marine fisheries biology	2 years
Freshwater fisheries biology (not merely fish culture)	2 years
Gear technology and fishing techniques	1 or 2 years
Fish processing	1 year
Fish culture (biologist)	1 year
Practical fish culture	6 months
Fishing boat mechanization	6 months or locally with foreign expert

The above periods should be considered as a minimum and are about one year short of the real requirements in view of the urgent necessity at present existing in Viet-Nam for fisheries administrators.

While it is true that the present economic situation in Viet-Nam requires immediate short-term projects, this cannot replace the need for properly qualified specialists for the long-term programmes. It should not be argued government programmes which can only become effective in five years time when the Vietnamese experts are ready to take over are not worthy of consideration ; had the recommendations made five years ago for the formation of government fisheries administrators been heeded they would now be available to take over the fisheries programme outlined above with a minimum of delay and the need for foreign experts would be far less.

8. CONCLUSION

This chapter does not aspire in any way to constitute an exhaustive study of the means by which the Vietnamese fisheries may be developed, which can only emerge with the effluxion of time as the programme develops. Manifestly, a detailed review of the fisheries cannot be achieved in a chapter of twenty or two hundred or even two thousand pages, nor could such a comprehensive monograph be attempted in the time available to the Mission.

It is, however, the belief of the Mission that, if the general outline here suggested is pursued, the development of the fisheries will follow naturally in the course of time and will parallel the general economic evolution of the country.

Advantage should be taken of the skills already existing and of the wealth^{of}/literature based on sound fishery principles which was published during the French administration as well as of that which exists in languages other than French.

Above all, the long-term aspects of fishery administration, the need for personnel with high educational standards and the establishment of permanent careers cannot be too much emphasized.