Furthermore, in the sense of facilitating full utilization of ongoing projects, Tha Thong Port Supporting Zone Development in Surat Thani and Klong Tachin Port Zone Development in Phuket are important. I would like to suggest that Tha Thong Port Supporting Zone will be a major center of fish processing and energy logistic services, while Klhong Tachin Port Zone should be promoted with its linkage to the proposed program of relocating small and medium scale industries.

In relation to the urban economic base development human resource development is one of the urban responsibilities besides the above. In order to cope with the forthcoming industrialization, higher educational or vocational facilities will be absolutely required to foster capable manpower and intermediate technologies within the subregion. In this regard, I would like to propose to establish a vocational training center with technical and market information functions in Surat Thani, and a higher educational facility equivalent to university in Phuket. Needless to say, since the urban development itself is comprehensive in nature, consideration should be given to various sectors in addition to these key projects, namely, commercial housing, social and public facilities, urban street development and so on.

Taking into account all the sectoral requirements, involved in urban planning, I recommend "Surat Thani Urban Structure Plan in the Year 2000". In this plan, I propose a liner structure composed of the backbone which is a part of East-West Link, and the three cores of Phun Phin New Town as a potential industrial zone, Phun Phin Town as the entrance to the railway and Surat Thani Town containing mixed basic functions. Intensive industrial and its related development zones are located at both sides of Tha Thong Port Area and Phun Phin Junction Area and industrial promotion zones are located at the two areas along the bypass of National Highway Route 401 which is a part of East-West Link. The urbanized area is around 5,000 hectares in which the Housing Complex Development containing 5,900 units is included. The projected urban population is 170,000 in the year 2000.

Now, regarding the Phuket Structure Plan in the year 2000, the city will have five corridors for expansion. One is the corridor extending toward Phuket Deep Seaport around which the industrial development potential would be high although its surrounding space is limited unfortunately. The second is the corridor extending toward the east where the location of small/medium scale fish processing industries is anticipated. The third is the corridor extending toward the west or the intensive tourism development zones where an attention should be paid to the environmental aspect. The forth and the fifth are the corridors toward the north and the south, which will be the major axis for urban area expansion. I gave "Ring and Ladder Pattern" to Phuket Structure. This pattern is suitable not only for future orderly expansion of the city but also for restructuring of the existing urbanized area. The projected urbanization area is 3,500 hectares including the Housing Complex Development containing 5,000 units. Population of the city will be about 150,000 in the year 2000.

The total project cost to realize these plans including social infrastructural developments will amount to 5.3 billion baht in Surat Thani and 6.1 billion baht in Phuket, of which 65 percent is to be born by the public and 35 percent by the private sector. If appropreate guideline and incentive are established, the private sector's contribution is expected to be made in such potentially profitable projects as housing complex development, commercial area improvement and residental small infrastructure development.

However, the public sector will have to bear 3.4 billion baht in Surat Thani and 4.3 billion baht in Phuket during the 14 year period until the year 2000, especially for developing major infrastructures and social facilities. How can the public sector bear a burden of this large amount? This is a critical issue. Regarding this issue, I would like to stress that it is very necessary to strengthen administrative and financial bases at the local level, because most part of the urban development should be taken care by local governments themselves.

I think that there are several measures to be tackled. Now, among other measures, I would like to stress particularly two important measures. One is to review and revise the existing local taxation system with an aim at establishing a definite "Property Taxation System". As other relevant studies suggested, by improvement of the existing local taxation system, it will be possible to make an amount of the local tax revenue two times as large as that at present. Another important measure is to increase "Municipal Development Fund" through diversification of its capital sources so as to enable the floatation of a loan for urban projects at the local level. I recommend to make this loan system useful and flexible so that municipalities can be encouraged to manage the urban projects within their responsibilities.

According to my estimation, if these two measures are taken, municipalities of Phuket and Surat Thani would be able to bear 23 to 24 percent of the total public sectors' cost by themselves, compared with 12 to 13 percent in the case without such measures. For the remaining portion, however, a strong central government's support will be necessary together with the effort to mobilize the private sector. Basically, the central government has to take the responsibility for major infrastructure formation.

In relation to this issue, several institutional arrangements are necessary. Now, I would like to point out four items. The first is to establish a legal base for urban planning and project implementation such as the landuse control based on zoning system, the housing criteria/standard, the regulations for public land acquisition and so on. The second is to improve a system of intergovernmental or interdepartmental coordination at the local level. For instance, concerning the city water supply system development, a definite division of responsibilities between Provincial Waterworks Authority and the municipalities should be established as soon as possible. For your reference, I suggest a system in which PWA takes responsibility in developing the systems of primary or stem distribution and industrial water supply while the municipalities take responsibility in developing

the feeder distribution system. The third is to explore a possibility to strengthen the central governments' support to specific regional cities such as Phuket and Surat Thani in terms of subsidy allocation. Lastly, the possibility to set up "Regional Urban Development Authority" is worth being explored for private capital mobilization and flexible project implementation especially for major urban infrastructure development.

At the end of my presentation, I would like to say that the urban development needs the people's regional-minded effort in a steady fashion. I hope that attractive regional cities will successfully be developed by your wisdom and your love to the region. Thank you for your attention.

4. POLICIES AND PROGRAMS FOR INDUSTRIAL DEVELOPMENT PRESENTED BY MR. MASARU KANEKO, INDUSTRIAL PLANNER

Your Excellencies, Mr. Chairman, ladies and gentlemen, in my presentation on the industrialization of the Upper South, I would like to discuss shortly what type of industries should be developed, when, where and how they can be developed.

First of all, what kind of industries we can think of for the Upper South in future? First is the resource processing particularly of rubber and oilpalm. While 80 percent of rubber products makers are concentrated on Bangkok, the Upper South is already making rubber hose for local tin mining in addition to smoked sheet and rubber blocks. This means, if other markets are put more closer to the Upper South, the Upper South can meet them with a greater input from the ongoing rubber replanting. At present, the Upper South has palm oil extraction plants. These can be added by palm oil refineries, as domestic downstream industries will expand in Bangkok and export market opportunity will come into the scenes.

Second is the export industries. Potential of Phuket to be a gateway to the overseas west has importance not only in terms of national transport system but also in terms of industrial export. Thailand is now exporting miscellaneous manufacturing products to Europe and Middleeast countries. They include apparels, footwear, watch parts, toy games and so on. With Phuket Deep Seaport and East-West Link, the Upper South can attract these industries. In addition, some of the light electric and electronic parts industries which have been rapidly growing in Singapore, Penan, Bangkok and elsewhere in Asian industrial towns can potentially be attracted to Phuket which was recently be put right on the international air route between these towns.

Third is the seaboard industries consuming energy, space, and water. These are all adequately be available in the Upper South. There are no such industries at all in the Upper South at present. But please keep in mind that the Upper South being the gateway to the South is a potential base for the seaboard industries with Khanom Deep Seaport which will enable face-to-face sea traffic to and from the Eastern Seaboard and the overseas.

However, we do not expect, of course, that these resource processing industries, seaboard industries and export industries will grow at the same time. Phasing is necessary. I think two points are important when we see the phasing for the Upper South industrialization. The first point is the difference between the Upper South and the Eastern Seaboard. The Eastern Seaboard has limited elements to generate substantial benefits during a long gestation period required to make a large-scale new industrial system. But in the Upper South, we find various resources which can earn, in part, the financial resources to return new industrial investments and also to generate infrastructure demand, for example cargoes, whereby gradual infrastructure expansion is made possible.

The second point is the interrelation between industrial development and other developments. Regarding the resource processing, industries are already picking up based on agricultural expansion and recent road network development. Timing of the seaboard industrial development depends on the progress of the Eastern Seaboard. The Eastern Seaboard development should go ahead, of course, and then the Upper South can materialize its seaboard development potential. As for the western-oriented export industries, the timing depends, in the main, on the connection between Phuket and Bangkok via Surat Thani. I mean, the completion of the East-West Link.

Therefore, we naturally come to the idea of phasing for the Upper South industrial development to consist (1) the resource processing development mainly during the period of Sixth Five-Year Plan, (2) the export industrial development during the Seventh Five-Year Plan and thereafter, and (3) the seaboard industrial development toward the year 2000 and beyond.

But in the way of this industrialization, the Upper South has to overcome many handicaps. First is the physical handicaps. The Upper South is still far from Bangkok. Resources are exported in a scattered manner due to inadequate transport network. For example, rubber of the Upper South is exported through many different places, including Phuket, Songkhla, Pattani, Kantang, Narathiwat, Bangkok and the Thai-Malaysian Boarder. And urban infrastructures such as water, telecommunication and distribution terminals are poor. In order to overcome these handicaps, we propose to develop the industrial areas which gather industries at strategic locations. We think, Phun Phin and northern part of Phuket are the best being at cross roads of various inland and sea transport as well as being close to major urban centers. Khanom is another strategic point for its proposed port and large space. To give cores to these industrial areas, we propose industrial estate projects at Phun Phin Highway Junction and immediate north of Phuket Airport with areal size of 1,200 rai and 600 rai, respectively.

The second handicap is the weak local base for industrial promotion. Although existing provincial industrial offices have been active, their capacities are far from adequate in terms of budget and number of staff members. Equally with rural development, industrial development needs public effort at the local level. We are recommending that the industrial offices be expanded and incorporated in an Industrial Promotion Center in charge of various noninvestment industrial services, consultation and technical studies.

The third handicap is the unstable investment climate, arising from both the fluctuating local economy and the low confidence of investors on security. The leakage of local economic benefits is supposed to be substantial since the amount of loans is only little more than half of the amount of deposits in the commercial banks in the Upper South. As a countermeasure to this, we think it is useful to introduce the Investment Promotion Zone to be designated by the Board of Investments in selected parts of the Upper South with special conditions effective to reducing the financial leakages. Partly for the same purpose, we recommend to create a local industrial development corporation which is to be run jointly by public and private. We assume that this

corporation has two functions. One is to purchase and sale the lands for industrial development by using low-interest and long-term credit such as those of Industrial Financing Corporation of Thailand. Another function is to finance the industrialists who come to the land. A recent news to set up a regional office of IFCT here in Surat Thani is encouraging in this connection. Proposed industrial estates can possibly be developed more smoothly than others by this kind of local private initiative.

To summarize my presentation, the resource processing industries, the export industries and the seaboard industries will carry forward the industrialization of the Upper South. These industries will be developed in a phased manner, namely, the resource processing industries during the Sixth Plan period, the export industries during the Seventh Plan period and thereafter, and the seaboard industries toward the year 2000 and beyond. As countermeasures to the handicaps peculiar to the Upper South, we propose industrial estate projects of two strategic locations, Industrial Promotion Center, BOI's Investment Promotion Zone and a joint public-private industrial development center. Finally, let me stress that the local industrialists are quite active in the Upper South. Our industrial survey suggests that more than 50 percent of them have willingness to expand investments in the South. I believe, a good combination of these local industrialists and major external investors is a key to the industrial development in the Upper South. Thank you very much for your attention.

5. POLICIES AND PROGRAMS FOR ENERGY DEVELOPMENT PRESENTED BY MR. MASUMI ISHIDA, ENERGY PLANNER

Thank you Mr. Chairman, Your Excellencies and distinguished guests, I feel highly honored to be given an opportunity today to share the thoughts which I have generated during the course of this study. My presentation consists of two parts. In the first part, I would like to touch briefly on the inherent nature of the environment surrounding the energy planning for the Upper South. Secondly, I would like to present the energy development plan for each energy subsector, namely, electricity, traditional energy and petroleum.

The decade 1970s closed with doubling the international price of crude oil in a single year, portending continued stress to the decade 1980s. The availability and cost of energy became an emerging constraint to the economic development in the beginning of the 1980s, especially for oil importing developing countries like Thailand. Although the world oil market appears to be glut because of worldwide energy conservation efforts and economic recessions, it is natural to envisage that the finite fossil energy resources will increase their value again towards the end of the 1980s and beyond. Another apparent indication for grobal energy outlook is that while the industrialized countries will reduce their rate of energy demand growth, the developing countries will require a faster energy demand growth to support their development.

In these regards, the study in the field of energy does not stand as a mere element of planning the infrastructure necessary to support development of the Upper South. The study necessarily has to look into key energy factors in the national perspective of current and future energy situation. Now, in the context of the Upper South energy consumption, the Upper South is consuming about 2.8 percent of the total petroleum products in the country, 2.5 percent of the traditional energy available in the country and 1.5 percent of the electricity generated in the country. Given the close relationship between economic growth and energy consumption, the magnitude of energy demand in the Upper South is predicted to be enormous in view of the industrialization and urbanization proposed by the Upper South Development Master Plan. The petroleum demand is estimated to increase by 3.5 times and the electricity demand by nine times during the period from 1980 to the year 2000. Since these energy demand increases are natural consequences of the development process of Upper South economy, the energy replenishment plan for the Upper South is set so as to achieve a stable and cost effective subregional energy system.

Now, talking about the electricity subsector, development scheme for the Upper South is that the Upper South will be the power center for the whole South. The Upper South will hold over 90 percent of the total installed power generating capacity of the South. A net additional power generating capacity of 821 megawatts is estimated to be required for the whole of the South toward the year 2000 to accommodate the previously said nine-fold demand increase.

This requirement will adequately be met by the latest power development plan of Electricity Generating Authority of Thailand for the South, in which the total net additional power capacity has been revised to be increased up to 858 megawatts. In attaining this capacity increase, a priority should be given to the maximum utilization of power resources endowments in the Upper South, including lignite reserves and hydropotentials. In this regard, we agree with the EGAT Power Development Plan. The Plan includes a lignite fired plant in Krabi (75 megawatts) to be commissioned in 1987, Chiew Larn Dam (240 megawatts) in 1987, and Kaeng Krung Dam (68 megawatts) in 1991 which will generate the benefits of irrigation, as well. In addition, EGAT plans to introduce imported coal in Krabi toward the year 2000 on top of the maximum utilization of lignite. I will tough on this later in my presentation on the possibility of natural gas utilization in the Upper South.

Another priority action in the field of electricity is to improve the quality and reliability of the existing power supply services especially for industry and urban development. The Power Distribution Reinforcement Project Third Stage by Provincial Electricity Authority needs to be stressed in this regard, as well as the ongoing PEA's electrification programs, including Accelerated Rural Electrification Project Second Stage.

As for the traditional energy such as charcoal, a sustainable yield of such fuel sources will be limited to one-third of the demand i.e., 612,000 cubic meters per year in the Upper South. Should the current consumption trend continue without any appropreate measures, illegal and chaostic cutting in the primary, secondary and mangrove forest will be the result. Currently, fuel woods are used mainly in residents, rubber smoking, fish meal and brick kilns. The scarecity of the traditional energy sources with growing demand would push prices of such fuels. Astonishingly, the situation where the commercial energy is competitive enough with the traditional energy in price has already been prevailed. Currently one baht worth of calorific value of charcoal is 1,225 kilocalories and that of LPG is 1,115 kilocalories according to our field survey.

Having these in mind, we propose two projects in the field of traditional energy to avoid undue burden on the traditional energy users. Utilization of such fuel sources and to achieve a smooth transition from traditional to commercial energy are the goals of such projects. The first project is the forestry management program as recommended in the agricultural development. A key to this program is to grasp the annual yield of various types of the forests. The second project is an ongoing one. That is the LPG Depot Project implemented by Petroleum Authority of Thailand in Surat Thani. Readily available commercial energy will eliminate the problems foreseen in the traditional energy sector. We, therefore, recommend strongly to persue this project.

Next topic is about the petroleum subsector and this is the main topic of my presentation today. Currently the people in the South pay, for every petroleum product, the prices which are 40 satang higher than those in Bangkok. If this price disparity continues, it would certainly be an obstacle to the promotion of industrialization in the region. The disparity in price stems from the current petroleum product replenishment system in which petroleum products are transported from the single remote supply center at the Bangkok Metropolitan Region to various scattered consumption centers in the South. Some of the petroleum products transport involve long haul trips from Sri Racha around Singapore all the way to Phuket. This system is thought even more inefficient when the current crude oil procurement practice is taken into consideration.

To remedy this price disparity by eliminating the double trips, we propose a refinery in Krabi. If I may sum up the fundamental reasons for the project in the form of the questions and answers, they would look like this.

The first question is why the project. The answer is, firstly, to ease the problem of higher oil product prices in the South thereby promoting industrialization and development. The second answer is to avoid expensive petroleum product imports and to materialize foreign exchange savings. We estimate that the volume of petroleum product imports in this country will increase to 10,000 to 12,000 barrels per day in the year 2000 even assuming the expansion of existing refineries to be completed as being proposed. Considering a growing demand for the middle distillates of crude in this country as well as in neighbouring countries, it would become costly to choose the petroleum product import option. The third answer is to diversify the petroleum supply center in setting up a cost effective petroleum system. In addition, the diversification of petroleum facilities would strengthen the national energy security and contribute to decentralizing the Bangkok-oriented economic activities.

The second question is why a capacity of 67,000 barrels per stream day or 60,000 barrels per calendar day. The first answer is to meet the estimated demand for petroleum product in the South. We project the total demand for petroleum products will reach this level in the latter half of the 1990s. The second answer is to meet 60 to 70 percent of the projected national import of petroleum products.

Then, the third question is why at Krabi. The first answer is that Krabi holds the strategic location for both crude import and products distribution. Although an effort is being made by PTT to diversify the crude oil supply sources, the Middle East will still be the main source of crude supply to this country considering a reserve-production ratio of the crude oil in the Middle East. The second answer is that Krabi is endowed with good natural conditions for direct receiving of crude, namely, sea depth and natural breakwater conditions. The proposed site would make it possible to accommodate a tanker being over twice as large as the ones used by refineries at Sri Racha. The larger the tankers are, the less you pay for the freight cost. In addition, the crude oil receiving facility for this project is a single mooring type

with a four kilometer long submarine pipeline. The feature would keep an investment cost required at minimal in comparison to the other alternative sites.

With the previously mentioned benefits and advantageous location at Krabi, the refinery there would yield an economic rate of return being 24 percent as against seven percent from an alternative refinery which is assumed to set up at the Eastern Seaboard for meeting the petroleum demand in the South.

Major constraints to this project are the current excess refinery capacity in the world and the OPEC's push into the refinery market. However, the excess capacity exists in the industrialized countries and the crude import/petroleum export countries without much domestic market, like Singapore, and not in the developing countries. The excess capacity in such countries has led to demolishment of the refineries with a total capacity of eight million barrels per day since 1980 until now. As for the OPEC's push into the refinery market, the effect of such events would be moderate when we consider their repercussions on the OPEC's crude prices and the OPEC's need for a coordinated production/export policy to satisfy varying OPEC member countries.

Since the commencement of this project is proposed to be in 1995, the decade long gestation period of the refinery project in Krabi will make it possible to carry out a feasibility study with more concrete information. It is presumed that such study will reaffirm the viability of the project. Thus the refinery project at this point as an element of our study, presents an advantageous option for Thailand. This project is supposed to achieve a beautiful harmonization between the national interest and regional interests.

As for the natural gas utilization scheme in the Upper South, there is still a considerable uncertainty in the whole supply cpacity itself. However after analysing available materials and having discussion with concerned agencies the most probable natural gas supply will be in the range of 1,000 to 1,200 million standard cubic feet per day at the peak production during the period between 1990 and the year 2000. In meeting this supply, the only possible natural gas utilization scheme would be the use in Eastern Seaboard Projects and the EGAT's further utilization.

Here, we have to consider the advantages of concentrated or scattered use of the natural gas. EGAT can certainly enjoy benefits from utilizing the natural gas as fuel source for its power plants, both existing and planned in the South. However, I believe that the benefits of the natural gas use should be maximized from the total national economic point of view. In view of the investments to be accumulated and the technologies to bestowed in the Eastern Seaboard vis-a-vis a maximum return to be brought for development from this scare resource, the long-term benefits derived from the concentrated gas use in the Eastern Seaboard would surpass the benefits which, otherwise, derived from the piecemeal uses as seen currently in a plan to develop pipeline to Khanom. Energy intensive industries to be located

in the Eastern Seaboard could easily absorb the volume of natural gas which are supposed to be consumed by EGAT facilities in the South. The natural gas utilization in a concentrated manner would bring up efficiencies in the production structure of Eastern Seaboard which this country must develop as a foundation for the growth in the years to come. Thus, we adopt the idea that the natural gas should be utilized at Eastern Seaboard. Should the strong indication for natural gas supply to exceed over 1,100 million standard cubic feet per day prevail in the 1990s, the natural gas would appear in the Upper South as an additional energy source to meet its increasing energy demand. This would not alter our development scenario for the Upper South. Rather it would strengthen our energy base for the Upper South.

In concluding my presentation, I would like to stress that the Upper South will be developed as the energy center for the South in an effort to achieve the decentralization of the national energy system. Sometimes in our life, we feel that we are really living by challenges. There is no failure in this world if we do not challenge and we do not take risks. However, the progress and growth lie in these challenges and risks. Thank you for your attention.

6. POLICIES AND PROGRAMS FOR AGRICULTURAL DEVELOPMENT PRESENTED BY MR. TADASHI KUME, LANDUSE PLANNER

Thank you Mr. Chairman, Your Excellencies and all the partisipants. In this session, I am going to present the agriculture development with an emphasis on the Centeral Lowland Development in connection with the landuse and land development. Then, fisheries will be discussed.

Generaly speaking, the South belongs to the tropical rain forest climate zone. This climate zone has the widest variety of vegetation species. This means that the zone is regarded as the most resource-rich from the viewpoint of bio-technological research and development. Now, I will start my discussion on the land potentials. Basic resource advantage of the upper south is land and water. A vast unutilized land of about four million rai exists in this subregion. This land has high potentiality for agricultural use, together with abundant rainfall. Most of the underutilized land lies in the Central Lowland, which has the highest potential for agricultural development especially based on the tree crops.

With these potentials as background, now, let me talk about the agriculture. Agriculture will continue to play a major role in absorbing the subregional employment of more than half a million persons. This is about half of the subregional employment in the year 2000. We propose two broad development strategies for this sector. The first strategy is to diversify the cropping pattern for strengthening the resilience of the subregional agriculture to the possible fluctuations of the market. The second strategy is to change the production pattern from extensive resource exploiting one to more ecologically balanced and intensive one. Priority crops are rubber, oil palm and rice. Here, I will touch on rubber and rice. Oil palm will be discussed later in conjunction with the development of Central Lowland.

Rubber production in Thailand will be increased from about half million tons per anum at present, to 1.8 million tons in the year 2000. The share of production in the world market will be increased from 14 percent at present to 26 percent in the year 2000, accordingly. The Upper South will account for about 20 percent of the total natural rubber production. This will be met by the increase in productivity from 60 kilograms per rai at present to 180 kilograms per rai in the year 2000. Office of Rubber Replanting Aid Fund is and will be playing the major role in this productivity increase. The world market is expected to be seven million tons or about two times as large as at present. While the Malaysian natural rubber production, which shares 40 percent of the world total at present, will reach a saturation point due to land constraints and a high yield already attained.

Rice production is aimed at attaining a level of the self-sufficiency within the Upper South. By the construction of Chiew Larn and Kaeng Krug Dams, the area under irrigated pady field will be increased to about 300,000 rai in the future. This can meet the self-sufficiency level.

On top of these three major crops, the reforestation, the aquaculture, the multiple utilization of coconut field and the animal husbandary should be promoted from the viewpoint of recyclic use of land. In connection with these agricultural development strategies, now, I will talk about the oil palm development in Central lowland. In view of this recognition, I will discuss, firstly, the development scheme, secondly, the constraints, thirdly, the programs and projects, and fourthly, the development cost.

I will firstly touch on the development scheme. Our basic concept is to enable the mixed developments of large-scale and small-scale estates. Production target for the year 2000 is 500,000 tons per anum of crude palm oil in the Upper South. It is 6.5 times as large as the present production. This target will be achieved by both productivity improvement and areal expansion. The productivity improvement will be achieved by the increase in both yield and rate of extraction. The areal expansion will need the opening of new plantations of 750,000 rai in the Upper South. The total area will thus reach one million rai in the year 2000. It is four times as large as at present. The Figure 1, a color map of the master plan 2000 which opens this final report, also shows high potential areas for oil palm plantation. The seven places indicated by green circle show the development units centering on both existing and possible location of palm oil extraction plants. Radious of the circles is 15 kilometers. These areas are identified to have high potentials based on our analysis of land capability, land availability and accessibility. Accessibility to Krabi, Khao Phanom, Pra Saeng and Khiansa will be greatly improved upon completion of the Krabi-Surat Thani Road Link proposed in our transport planning study. The increased output of palm oil will be supplied to the domestic market in the near future and to the international market in the long run. An expected volume of export will, however, be marginal. Maximum export volume anticipated in the year 2000 is assumed to be less than 10 percent of the Malaysian export volume.

Now, I will discuss the second topic, which is the constraints. There are three major constraints to be overcome. They are (1) the land, (2) the finance and (3) the extension services in connection with research and development. For large-scale estate, the land availability and land aquisition are the major constraint, while the stability of land tenure is the major constraint for small holder. Due to a large amount of investment and a long gestation period before maturing, financial problems hang especially over the small holders. The lack of adequate technological and managirial knowledge and the limited affordability to adopt improved technologies are the major constraints for the small holders to improve their productivity.

To overcome these constraints, now, I am going to discuss about the third topic of programs and projects in connection with possible government participation. At first let me talk about the land issue. This is a complicated problem in the way of oil palm development. Royal Forat Department, Department of Land, the local governments and the financial institutions concerned have to be closely coordinated to solve this problem. We propose a new scheme of land resettlement, which is an integration of ongoing programs and projects carried out by

different governmental agencies. The South Thailand Regional Planning Study undertaken in 1973 recommended the development of oil palm plantations in the Central Lowland. And, infact, the recommendation has been followed by a rapid expansion of oil palm estates in the Upper South by private efforts. However, the productivity has been less than what this study expected before. One of the reasons for this is the lack of adequate knowledge of how to manage the plantation development by the small holders.

Provision of the financial support linked with technical assistance is indispensable for oil palm planters. Bank for Agriculture and Agricultural cooperatives will play a major role in this action. BAAC has already experienced several plantation development under the resettlement projects in the Upper South.

Research and Development and its extension services will be another significant responsibility of the government. Regarding this issue, the following actions are particularly recommended:

1) Development of the most productive seedlings suited for the style of farm management and the land conditions in the Upper South,

2) Provision of the extension services and technical assistance in coordination with financial support as well as with the marketing information services,

3) Setting up of the product quality standards, and

4) Integration of the R & D know-how in view of possible application to other crops which may emerge as viable ones in future.

Now, let me talk about the last topic, which is the development cost. The oil palm development in the Central Lowland will cost 7.3 billion baht in total. We propose that 40 percent of the total investment cost is to be shared by the government. It is equivalent to 2.6 billion baht for the 15-year period of up to the year 2000. One-third of this amount will be allocated to the infrastructure development and administrative assistance such as land surveys mainly at the local level. Another one-third will be allocated to the extension services such as those in supply of seedlings. The remaining one-third will be allocated to the research and development.

As an immediate action, it is desired to conduct a study to assess the performance of Rubber Replanting Program and the BAAC-financed Resettement Scheme from the view point of applying their experiences to the Central Lowland Development Project.

Now, I am going to another subject of the fishery development. Marine fisheries production unloaded in the Upper South accounted for one-tenth of the total production in Thailand or 175,000 tons in 1982. The Upper South has the following advantages regarding the future development of marine fisheries:

1) The good access to excellent fishing grounds around Samui and other islands which are known as the best fishing grounds for shrimp and pelagic species,

2) The good access to fishing grounds in the Andaman Sea, and

3) The good access to international fishing grounds for deep sea fishing in the Indian Ocean.

For fishery development, two strategies are recommended:

1) To maintain and increase marine fish resources of the adjacent sea by prohibiting large-scale fishing especially on trawling and by designating it only for small-scale fishing and fish culture, and

2) To contribute to maintaining the capacity of domestic fish supply by promoting deep sea fishing and improving the local system of fish preservation and processing.

Under these strategies, the following three actions are of particular importance:

1) The designation of aquaculature zones in the bays of Ban Don, Phangnga and Kantang, the improvement and diffusion of aquaculture technologies and the expansion of hatcheries for seed production,

2 The study, experiment and development of artificial reef with a research center in Phuket, and

3) The fish port and processing base development at Tha Thong, Kantang and Phuket.

Thank you for your attention.

7. POLICIES AND PROGRAMS FOR WATER RESOURCE DEVELOPMENT PRESENTED BY MR. MASAHIRO NAKASHIMA, WATER RESOURCE PLANNER

Thank you Mr. Chairman. I would like to thank Your Excellencies and all the participants for your presence. In my talk, I will present two topics. They are Tapi-Phum Duang River Basin Development and Phuket Water Supply.

The first topic is Tapi-Phum Duang River Basion Development and Management. Why a river basin planning is necessary? Because there are often conflicting interests among users where there is a need for multiple uses of water resources. So, it is necessary to coordinate different interests or users by basin planning. Then, we could maximize the benefit through an optimal use of water resources. This is the rational or philosophy of river basin planning.

Various components are proposed for the development of this river basin. In the upstream of the river, hydropower generation and watershed management are the major components, while major components in the downstream are urban/industrial water supply, flood control, pollution control and esturin environmental control. Between the upstream and the downstream, irrigation is proposed as a major component. With reference to the location of these components (see Figure 1, a color map of the master plan 2000 which opens this final report), the hydropower development component comprises Chiew Larn Dam which is ongoing and Kaeng Krung Dam which we are proposing. The irrigation development component extends over the left bank of the Phum Duang River. A bypass waterway is proposed at around the confluence of the Tapi and Phum Duang Rivers for the purpose of flood mitigation. Environmental protection is proposed around the delta and the bay area as well as at the watershed in terms of forest conservation.

Among these components, I would like, now, to put my focus on the four major components of hydropower development, flood control, irrigation and water supply. The first component is hydropower development. Chiew Larn Dam is being constructed now with a capacity of 240 megawatts or 553.7 gigawatt-hours per year. This project includes many other potential benefits such as flood control. In addition to this dam, Kaeng Krung Dam is being proposed for construction with a capacity of 68 megawatts or 165 gigawatt-hours per year. This project also includes many other potential benefits such as irrigation. Considering the many potential benefits, we propose Kaeng Krung Dam Hydropower to be implemented in the framework of basin development. This project also brings a big irrigation benefit to the left bank of the Phum Duang River.

The second component is flood mitigation. Chiew Larn Dam is expected to give a flood mitigating effect by reducing the floods of the Phum Duang River by 30 percent. Considering the floods of both Phum Duang and Tapi Rivers, however, we need an additional measure at the downstream. So, we propose a bypass waterway, near the merging point of Tapi and Phum Duang Rivers. This measure appears to be the least cost alternative among other possible ones. With the effect of Chiew Larn Dam, this project should ease floods in the left bank of Phum Duang Downstream and the Phun Phin River. In order to implement this project, however, we need extensive hydraulic data and experiment.

The third component is irrigation development. Since there is enough water in the Phum Duang Basin, it can be utilized to attain self-sufficiency in rice and production increase of other crops in the Upper South. And this is in accordance with the goal of increasing agricultural productivity as stressed in the Fifth National Economic and Social Development Plan. So, we propose irrigation development through utilizing Chiew Larn Dam for 90,000 rai and Kaeng Krung Dam for 250,00 rai. In order to implement this project, it is necessary to fully evaluate agricultural benefits and to study coordinated reservoir operation of the two dams for multi-users.

The last component is an urban and industrial water supply project. This is to supply water to the Surat Thani-Phun Phin Urban Area and the new industrial areas including Phun Phin Industrial Estate which is proposed in our industrial planning study. We propose to implement this project in three stages of Stage 1 (-1987), Stage 2 (1988-1990) and Stage 3 (1991-1993). Additional capacity of water supply will be 10,000 cubic meters per day in Stage 1, 22,800 cubic meters per day in Stage 2 and 21,400 cubic meters per day in Stage 3. Altogether, this will meet the total demands expected in the year 2000.

Now, I have talked about the four major components. Here I would like to touch on the relative position of these components and projects in the whole system of this river basin development and management. Chiew Larn Dam and Kaeng Krung Dam are the core of the whole system and they contribute to other projects. An important point is that there will be a division of main functions between Chiew Larn and Kaeng Krung Dams. Chiew Larn Dam will be used for the main purpose of power generation and flood control while Kaeng Krung Dam is proposed for the purpose of irrigation mainly and power generation to a limited extent. In the meantime, the urban/industrial water supply in the downstream needs the effective operation of Chiew Larn Dam so as to minimize seasonal fluctuations of river flows and prevent backward flows of sea water. Flood control is to be attained by compounded effects of Chiew Larn Reservoir and proposed Bypass Waterway. Here, I would like to emphasize again the philosophy of the basin planning. That is the importance of coordinated and integrated approach to development.

In concluding my presentation on the first topic of the Tapi-Phum Duang River Basin Development and Management, I would like to mention about the cost aspect and some recommendations. The total cost of the four major projects is estimated at four billion baht. With this an aggregate Internation Rate of Return is calculated at 18 percent. This should indicate that the power and irrigation benefits alone are supposed to exceed the total cost. Finally, it is recommended to update the comprehensive basin study undertaken by Royal Irrigation Development in 1973 and to study the optimal utilization of the two dams for various development components. We also recommend a committee to be set up in order to coordinate various water users and agencies of the river basin.

The second topic is Phuket Water Supply. This is to supply water for urban, industrial and tourism activities in the island. The total water demand is projected to be 54,000 cubic meters per day in the year 2000.

We examined two alternative methods for this project. The first alternative is to utilize the water resources on the Phuket Island. In this alternative, it is necessary to develop small sources of water step by step, by building many small dams and pipelines. The second alternative is to develop a source of water at one time by building two dams in Phangnga and a long pipeline between Phangnga and Phuket. The total investment cost is estimated at 565 million baht under the first alternative and 1,059 million baht under the second alternative. So, we propose the first method as a least cost alternative. Accordingly, we identified seven reservoir locations, including Ban Wat Dam which is ready for use, out of twelve candidate locations. Major pipelines are proposed to connect these seven reservoirs with selected demand centers, including Phuket Municipality, the intensive tourism development areas on the western coast, Phuket Deep Seaport and its vicinity and the proposed Airport Industrial Estate.

In concluding my presentation on the second topic of the Phuket Water Supply, I would like to point out that the first alternative costs about half as much as the second alternative. However, unit cost of water is high since many facilities have to be built. Therefore, subsidy for water charges seems to be essential, if water charge should be kept low as it is now. Anyway, it is recommended to undertake a detail study of the water availabilities and demand of Phuket Island and examine an optimal allocation of the available water resources. Furthermore, it is recommended to construct a treatment plant and transmission pipelines for utilizing Bang Wat Dam as soon as possible.

Now, I have presented the two topics of Tapi-Phum Duang River Basin Development and Management, and Phuket Water Supply. Before I finish my talk, I would like to mention that the availability of water resources in the Upper South can satisfy the demand until the year 2000. However, water availability after the year 2000 appears to be critical on the Phuket Island. That is all my talk. Thank you very much.

8. PRESENTATION OF POLICIES AND PROGRAMS FOR TOURISM AND ENVIRONMENT BY DR. JINICHIRO YABUTA, REGIONAL PLANNER

Thank you Your Excellency and Mr. Chairman. Yesterday, we were discussing about the resources for production purpose. My presentation today is different. I would like you to see the same resources from the viewpoint of tourism and environmental control. Let me present the tourism first and next the environment.

Now, tourism is a growing industry in Thailand. And in Thailand, the Upper South is attracting eight percent of foreign tourists and seven percent of domestic tourists. The relative weight of the Upper South will be greater in the Thai tourism, because the tourists from and through the nearby countries such as Singapore and Malaysia are increasing. The Upper South situates just between three major tourism markets of Bangkok, Singapore and Malaysia. In the future, we expect the Upper South to attract 1.8 million tourists in the year 2000, compared to 300,000 in 1980.

Major potential attractions of the Upper South are (1) the beaches which are existing side-by-side with good urban amenity in Phuket, (2) superb coastal views of Phangnga and Krabi with possibly better access from Phuket, (3) the beaches of Ko Samui being a resort of long-term potential in the eastern side, and (4) other scattered tourism resources such as historical and cultural assets in Chaiya and Wiong Sa and Chiew Larn Dam as a man-made tourism destination. There are, however, several problems in making use of these potential attractions. Firstly, they are scattered without good transport services connecting them each other. Secondly, monsoon causes a large seasonal fluctuation in tourism demand. Thirdly, urban services and utilities are still poor to satisfy tourists and to accommodate more tourists. Water supply is a crucial issue as we discussed yesterday. Forthly, there is no clear system of administrative responsibilities to coordinate the various actions necessary for tourism development, including tourism environmental control. In addition to these, transport system, especially international and domestic air transport services need further strengthening.

Well, with these potential attractions and problems, we would like to the Upper South tourism to challenge two things. One is to attract as many tourists as possible in the expected tourism market. The other is to maintain the high quality of resort environment so as to let the Upper South keep its competitiveness with similar tourism areas in and around the country.

For the purpose of promotion, which is the first challenge, we are proposing several major tourism attractions to be created. First, in Phuket side, we are proposing (1) the intensive beach area development in Patong, Karong and Kata (2) the "free trade zone" for tourist shopping as being considered by the government at present, although its scale will be smaller than those in Singapore in view of tourism volume, and (3) the development of marine park and a logistic base for marine recreation at around the Phuket Aquarium which has a temporary

berth at present. We recommend these to be started during the Sixth Five-Year Plan period. And thereafter, we propose the attractions to be spread over Phangnga and Krabi with a center in Phuket. Toward this direction,we are proposing the New Phuket Bridge of East-West Link as a tourism spot and also as a symbol of the western gateway like the Golden Gate Bride. A bridge park is desired at the foot of the bridge. Another proposal is the improvement and development of sightseeing terminals to form a network of coastal tourism transport in the Phangnga Bay. Yesterday, our transport planner proposed Phuket-Krabi Ferry. It will form a part of this network.

Now in Surat Thani side, what we are proposing for the Sixth Five-Year Plan is, first, the improvement of the access from Surat Thani to Ko Samui, by relocating the existing tourism boat terminal from Ban Don to Tha Thong. This action should be coordinated with the renewal of Ban Don Port Area for urban development purpose and with the proposed fishery base development at Tha Thong Port Area. Second, we are proposing to promote tourism in the potential spots which are easily accessible from Surat Thani. They include development of a historical park and a traditional industrial center in Chaiya, promotion of ongoing excavation of the Wiang Sa Ancient City and improvement of a visitor's center and related facilities at Chiew Larn Dam. After the Sixth Five-Year Plan, then, we propose Ko Samui to be developed as another active tourism island. This will involve, again, the intensive development of selected beaches and the improvement of utilities, including water and power.

Here, I have to put it clear that Phuket and Ko Samui are different in three points. The first point is that Phuket has a good access to tourism markets while Ko Samui is more isolated. The second point is that Phuket can attract not only those who favor natural tourism assets but those who favor tourism attractions in the city, while Ko Samui attracts mainly those who favor natural tourism assets. And the last point is that Phuket has relatively strong administrative machineries just in the tourism spot to cope with demands and problems arising from tourism growth while Ko Samui is handicapped in this regard. This is why we proposed to develop Phuket first and, then, Ko Samui. Or else, another option would be to let private developer to lead integrated tourism development of Ko Samui. Throughout the period toward the year 2000, anyway, strengthening of air transport service will be very important. Expecting the more air passengers, higher frequency of flights and larger size of aircrafts, we propose that the existing long-term airport development master plan will have to be accelerated by a couple of years.

Now, let me talk about the aspect of resort environmental maintenance, which is the second challenge. For this matter, we propose to classify the beaches in Phuket and elsewhere into those to be developed intensively, those to be developed to a limited extent and those to be preserved. And this zoning system is desired to be authorized and enforced with a set of criteria and standards for buildings at beach areas. Moreover, we recommend that the zoning system be linked with tax incentive and the criteria for public-private demarcation or cost-sharing in the development of utilities and infrastructures. For this system, however, strengthening of monitoring capabilities of local governments is necessary.

Finally, for the implementation of tourism development, strengthening of coordinating capability of the Tourism Authority of Thailand is, I think, one of the most important issues. Tourism development is not simply a job of advertisement or travel agent. It needs a strong coordinator to design and adjust various agencies related to tourism, whether directly or indirectly, such as urban development, transport, landuse control and local administration.

Now, I would like to give my presentation on the topic of environment. First of all, please take a look on some pictures which show the Landsat Image of Phuket and Ban Don Bay. You can see clearly the environmental desruption by off-shore tin mining activities at the eastern coast of Phuket. Its western coast is very clear thanks to the government clear decision to regulate off-shore mining on this side. You can also see the extensive and high sedimentation of Ban Don Bay in Surat Thani. This is largely due to the silting from Tapi/Phum Duang Rivers. At the same time, I hope, you observe a belt of shrimp fishfarming on the eastern half of the coast This has been made, both legally and illegally, at the cost of mangrove forest. Now let me show you the existing landuse of the whole Upper South. While its western half is covered by forest, eastern half has vast idle land created after tree cutting and shifting cultivation. You can see a recent forest encroachment, here, along the national highway between Surat Thani and Takua Pa. This highway was constructed 14 years before this map was made. In 14 years, the national highway provided good access to lumberers to accelerate deforestation in this way. Then, I would like you to take a look on the lands in Takua Pa which is the center of tin mining. As you see, extensive lands have been injured by tin mining and remained with nothing done. In addition to these existing environmental problems of deforestation, coastal environmental deterioration and tin mining, we have to pay an increasing attention to the future problem of industrial pollution. Especially, industrial waste water could be an additional threat to the fishfarming and tourism.

Now, our recommendation is this. First, we recommend to increase the forest area. At present the forest area accounts for 30 percent, and in year 2000 it is proposed to increase up to 40 percent which was once attained until the early 1970s. This recommendation is consistent with our proposal to set the speed of overall farm land expansion within 1.8 percent per year. And this is possible by giving priority on replanting than expansion in case of rubber and by limiting the speed of oilpalm land expansion at nine percent per year.

Second, particularly in relation to the deterioration of forest and river environment due to tin mining operation, we recommend to launch an integrated action to rehabilitate Takua Pa Area which is most severely affected. In addition to the environmental damage by tin mining, rainfall in Takua Pa is among the heaviest in the Upper South and causes flood due to erosion. Here, environmental rehabilitation is a pressing need as a precondition to diversify its economy which is dependent on fluctuating tin demand. The action will include the conversion of tin-excavated lands into forest, grazing and crop lands, the utilization of mining ponds for fishery and reservoir, and the land use and building control in the critical areas subject to flood. We do not recommend large investment on river control itself. For this purpose, however, we propose to earmark a Special Maintenance Fund to be collected from tin miners, although this proposal is rather moderate

when compared with a strong statement in the Fifth-Five-Year Plan, saying that "Mining operators must bear full cost for restoring the quality of soil after mining", which is quite different from the actual scene.

Third, we recommend to establish a realistic and comprehensive criteria to preserve and to use or cut down the mangrove forest. There are many potential users of coastal line including fishfarming, tourism, port, industries and others as development will be more seaboard oriented. We need to think of a balanced use of the mangrove area which amounts to 550,000 rai in the Upper South.

Fourth is the industrial pollution control. From the environmental viewpoint, too, we recommend to gather industries within selected areas. We are proposing to set up waste water treatment facilities of four hectares in Phun Phin Industrial Estate and two hectares in Phuket Airport Industrial Estate.

Finally, let me stress that I am not talking about the environmental control as a pure environmentalist. But I would like to say that environmental problem here is a necessary part of the resource management for the Upper South's economic development. Thank you for your attention.

ANNEX III

SCOPE OF WORK

FOR

THE SUB-REGIONAL DEVELOPMENT STUDY

OF

THE UPPER-SOUTHERN PART OF THAILAND
(SURAT THANI-PHUKET ZONE)

AGREED UPON BETWEEN

THE NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT BOARD

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

16th November 1982

Mr. Yukio HARADA
Leader of the Japanese
Preliminary Survey Team

on behalf of
JAPAN INTERNATIONAL
COOPERATION AGENCY

Dr. Snoh UNAKUL
Secretary-General
National Economic and Social
Development Board

I. Introduction

In response to the request of the Royal Thai Government, the Government of Japan has decided to conduct a sub-regional development study of the upper-southern part of Thailand (Surat Thani-Phuket Zone) (hereinafter referred to as the Study), within the general framework of technical cooperation between Japan and Thailand which is set forth in the Agreement on Technical Cooperation between the Government of Japan and the Royal Thai Government signed on 5 November 1981. The Japan International Cooperation Agency (hereinafter referred to as JICA), the official agency responsible for the implementation of technical cooperation programme of the Government of Japan, will accordingly undertake the Study in accordance with the relevant laws and regulations in force in Japan, in close cooperation with the Thai authorities concerned.

In April 1982, the Government of Japan sent a contact team headed by Mr. Seiichiro OTSUKA, Director, Development Cooperation Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, in order to acquire further knowledge on the background of the request. After the contact team held a series of discussions with officials of the Royal Thai Government, both sides reached a mutual understanding on several matters concerning the Study.

Following the contact team, JICA sent a preliminary survey team (hereinafter referred to as the Team) headed by Mr. Yukio HARADA, Senior Coordinator, Planning Department, Japan International Cooperation Agency, in November 1982 to discuss the content of the Study in detail with the National Economic and Social Development Board (hereinafter referred to as NESDB) and other authorities concerned of the Royal Thai Government. The final meeting was held on 16 November 1982 and both sides agreed on the Scope of Work of the Study.

The present document sets forth the Scope of Work of the Study.

II. Background of the Study

The Royal Thai Government is now carrying out the Fifth National Economic and Social Development Plan. One of the major development objectives is to accelerate industrial development with particular emphasis on types of industries which will ensure maximum use of indigenous resources.

In the light of this major development objective it will be necessary to establish closer relationship between the southern economy and the rest of the country and to retain the value added of major economic sectors in the south for regional and national benefits, and also given the potential role of the Study area to become an alternative urban and industrial complex to Bangkok and the Eastern Seaboard during the Sixth and subsequent Plans because of the possibility of putting onshore the natural gas pipeline in the upper south, the Royal Thai Government has an intention to promote regional development in the relatively underdeveloped upper-southern part of the country, and therefore has requested the Government of Japan to conduct a study on the sub-regional development of this area, focussed on Surat Thani-Phuket Zone.

III. Objectives of the Study

The Objectives of the Study are:

1. to prepare a sub-regional development master plan for the socio-economic and physical development with particular emphasis on urban and industrial development and major transport and communications networks within the Study area, taking into account existing plans and programmes;

2. to identify, within the context of the master plan, priority programmes and projects; and

3. to prepare prefeasibility studies of high priority projects.

IV. Study Area

The Study area, known as Surat Thani-Phuket Zone, covers an area of approximately 22,000 sq.km. and encompasses Surat Thani, Phuket, Krabi, Pang-nga provinces and Kantang district of Trang province.

V. Scope of the Study

A. General

The study intends to prepare a master plan on the sub-regional development of the Surat Thani-Phuket Zone with emphasis on urban and industrial development and major transport and communications networks. The Study will also present recommendations for the implementation, together with prefeasibility studies of high priority projects taking into account the following main items.

1. The target year of the Study is the year 2000.

2. Since timely completion of the Study is imperative, full utilization of existing and available information, data and other relevant materials is prerequisite for the Study.

3. The Study will concentrate on matters in the Study area unless otherwise specified. But it may refer to general natural conditions and socio-economic situation in Thailand and the southern region if necessary.

B. Major Items of the Study

Step 1. Analysis of the present situation for development

The present situation of basic natural-physical conditions, socio-economic situation and sectoral development will be analyzed in the following subjects as detailed in sub-items 1 - 6. Then, current bottlenecks and constraints for development will be identified. Existing study reports will be fully used, expecially in agriculture and other primary sectors.

1) Basic natural-physical conditions on climate, land, human settlement, water and natural resources.
2) Present regional socio-economic situation.
3) Present situation of sectoral development.
4) Land use.
5) Infrastructure, public utilities, housing and services.
6) On-going and proposed development projects.

Step 2. Identification of the development potentials

The development potentials in each sector as outlined below will be identified, mainly but not exclusively from the view point of utilization of local natural resources and of establishment of closer relationship between the southern economy and the rest of Thailand, taking local development potentials into account. Agriculture and other primary sectors will be referred mainly but not exclusively from existing study reports. For tourism development and environmental protection it will be necessary, in relation to existing reports, to identify impacts and interactions arising from potential development actuvities.

1) Mining, basic industries and other resource-based industries.
2) Transport and communications networks.
3) Urbanization and town development.
4) Water resource development to serve industry, agriculture, power generation and urban needs.
5) Others.

Step 3. Preparation of overall development framework

Consistent with the basic national policy of the Royal Thai Government, development objectives and strategy of the sub-regional development master plan will be prepared, taking into consideration the future role of the Southern region in the economy of the whole country.

The following steps are envisaged :

1) setting of development objectives,
2) preparation of socio-economic framework,
3) general land use plan,
4) settlement and urban structural plan,
5) planning of infrastructure and public facilities.

Step 4. Preparation of sub-regional development master plan

Subject to the development strategy which is prepared in Step 3, sectoral development plan will be established. Then, a sub-regional development master plan of the Study area will be prepared.

Step 5. Identification of possible priority programmes and projects

In view of the sub-regional development master plan prepared in Step 4, priority programmes and projects for the development of the Study area will be carefully identified and examined.

Step 6. Pre-feasibility study of high priority projects

High priority projects which are expected to be implemented during the Sixth National Economic and Social Development Plan will be selected with the consent of the Royal Thai Government and preliminary cost estimates will be made.

VI. Reports

JICA will prepare and present the following reports in English to the Royal Thai Government in the course of the Study.

1. Inception Report
   - 100 copies
   - within one month after the commencement of the Study

2. Progress Report
   - 50 copies
   - in the course of field surveys in the Kingdom of Thailand

3. Interim Report
   - 200 copies
   - at the end of the study in the Kingdom of Thailand

4. Draft Final Report
   - 100 copies
   - at the end of work in Japan
   - The Royal Thai Government will provide JICA with its comments within two months after receipt of the Draft Final Report.

5. Final Report
   - 300 copies
   - within two months after receipt of the comments on the Draft Final Report.

VII. Institutional Framework

For the Thai Side, NESDB will serve as the agency responsible for the coordination of the Study.

NESDB will establish a Policy Coordinating Committee and a Technical Committee.

For the Japanese side, JICA is the organ responsible for the execution of the Study.

VIII. Tentative Study Schedule

The whole work will be conducted in accordance with the attached tentative study schedule.

IX. Undertakings of the Royal Thai Government

In accordance with the Agreement on Technical Cooperation between the Government of Japan and the Royal Thai Government, the Royal Thai Government shall accord privileges, immunities and other benefits to the Japanese Study team and, through the authorities concerned, take necessary measures to facilitate smooth conduct of the Study; especially

1. To furnish the Study team with available relevant data, information, and materials for the execution of the Study.

2. To arrange for the Study team appropriate office space, office equipment, materials, and clerical services for the execution of the Study.

3. To provide the local staff necessary for the performance of the duties of the Study team.

4. To provide the security for the Study team.

5. To assist the Study team to obtain other facilities and conveniences deemed necessary for the conduct of the Study.

X. Contributions of the Government of Japan

1. To dispatch a full scale Study team to the Kingkom of Thailand to conduct the Study.

2. To bear travel expenses and fares between Japan and Thailand and those necessary for travelling within the country as well as charges of lodging and living expenditure for the members of the Study team.

ANNEX IV STAFF INPUT

TEAM EXPERTS

1.	Masahiko Honjo	Team Leader
	* * * * *	
2.	Jinichiro Yabuta	Regional Planner
3.	Nobuhiro Koyama	Transportation Planner
4.	Katsuhide Nagayama	Urban and Human Settlement Planner
5.	Masumi Ishida	Energy Planner
6.	Tadashi Kume	Land Use Planner
7.	Masaru Kaneko	Industrial Planner
8.	Yutaka Inoue	Regional Economist
9.	Yukio Hoshino	Agricultural and Water Resource Planner
10.	Mutsuhiro Fujita	Industrial Planner
11.	Kunimasa Nishigaya	Project Analyst
12.	Masaaki Komatsu	Economic and Financial Planner
13.	Masashi Hattori	Tourism and Environmental Planner
14.	Shigeru Murata	Port Planner
15.	Yasuo Kanesato	Port Planner
16.	Chiharu Fukuda	Civil Engineer
17.	Norimasa Arai	Railway Expert
18.	Masahiro Nakashima	Water Resource Planner
19.	Yoshihiro Asano	Urban Planner
20.	Tadahiko Yagyu	Port Planner
21.	Kiyotake Ito	Industrial Area Planner
22.	Machiko Watanabe	Demographer
23.	Yasuhisa Kato	Fishery Planner
24.	Noriyoshi Nagamatsu	Project Economist
	* * * * *	
25.	Ryokichi Hirono	Development Economist
26.	Takeo Kuroko	Market Analyst

SUPPORTING MEMBERS

1.	Yasunobu Kawato	Administrative Manager
2.	Fukunari Kimura	Fieldworks Coordinator
3.	Michiaki Hosono	Agricultural Specialist
4.	Hiroshi Ueno	Regional Development Speicialist
5.	Koichiro Akimoto	Industrial Analyst

ANNEX V LIST OF STUDY REPORTS AND PAPERS

1. REPORTS

Inception Report

Progress Report I

Progress Report II

Interim Report I :
- Volume 1 Main Report
- Volume 2 Annex

Progress Report III

Interim Report II

Draft Final Report :
- Volume 1 Master Plan
- Volume 2 Sector Plan

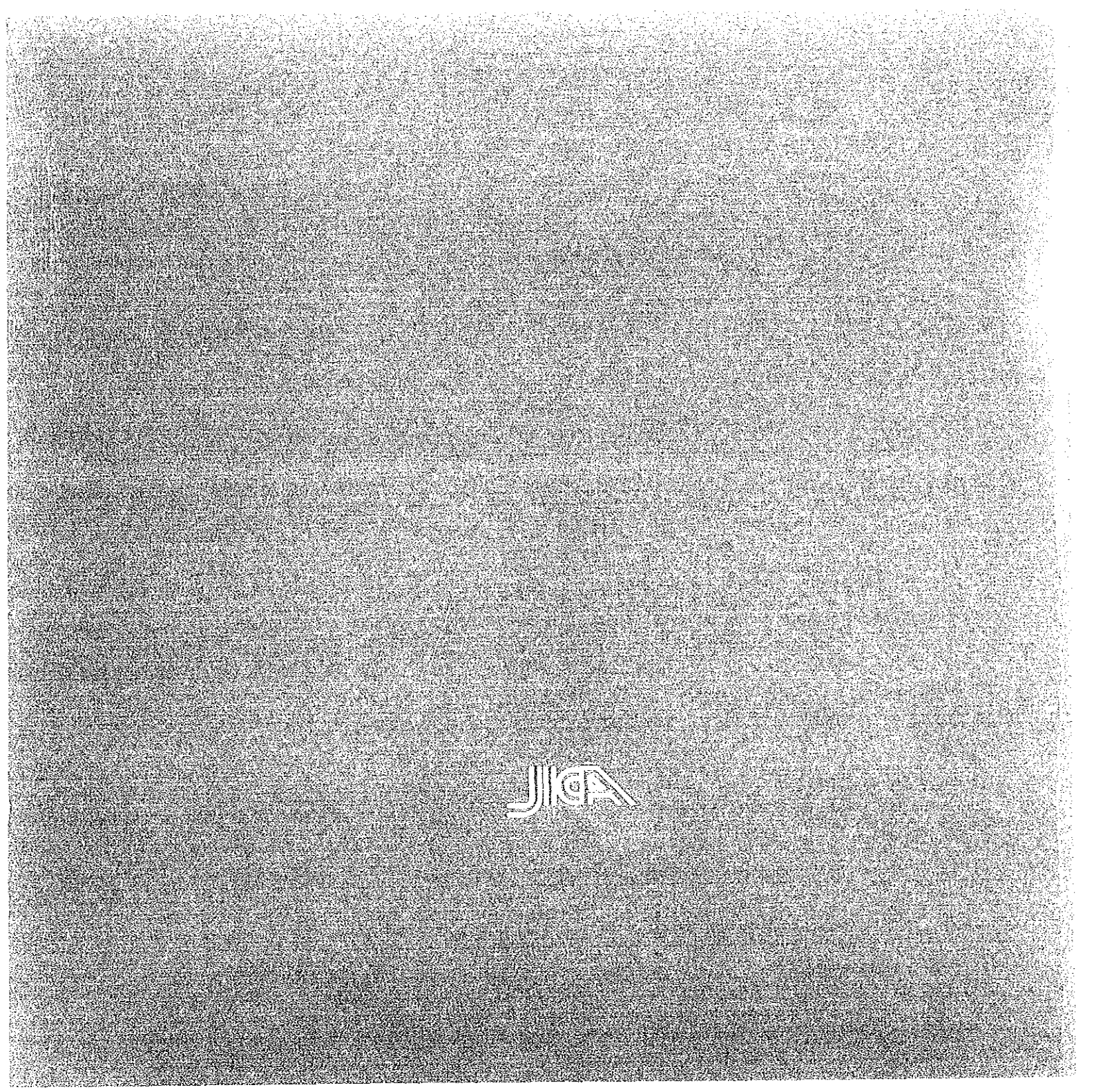
Final Report :
- Volume 1 Master Plan
- Volume 2 Transportation
- Volume 3 Urban Development
- Volume 4 Industry
- Volume 5 Energy
- Volume 6 Primary Resources
- Volume 7 Tourism

2. PAPERS

Executive Summary Papers :
- Progress Report I
- Progress Report II
- Interim Report I
- Draft Final Report

Papers for Seminar, Phuket, June 30, 1984
1. Land Use, Water Resource and Human Settlement
2. Agriculture, Industry, Tourism, Mining and Energy
3. Ports, Roads and Railways

Papers for Seminar, Surat Thani, January 25-26, 1985
1. East-West Link, Port System and Urban Development
2. Industry and Energy
3. Agriculture and Water Resource
4. Tourism and Environment
5. The Subregional Development Study of the Upper Southern Part of Thailand : An Outline


JICA