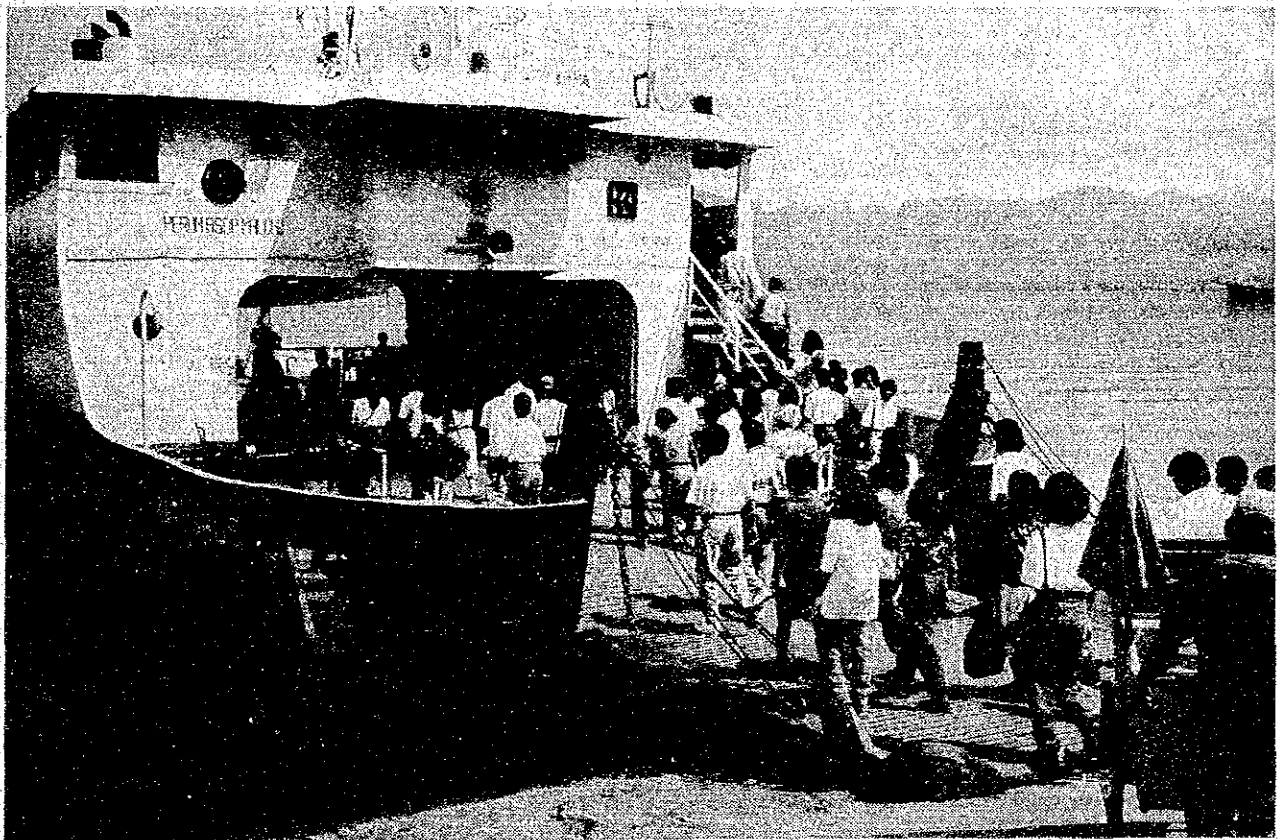


PART 1

PRESENT SITUATION OF FERRY TRANSPORTATION IN INDONESIA



Scene of Embarkation

Chapter 1 Ferry Transportation System and Activities

1-1 General

1. Ferry transportation plays an important role in archipelagic countries like Indonesia. The Indonesian government defines ferry services as follows.
 - a. A ferry is a floating bridge.
 - b. Ferry activities consist of carrying passengers and cargoes across a river or body of water.
 - c. Ferry activities have fixed routes and regular schedules.
 - d. A ferry vessel is a special form of vessel.
2. The Indonesian government constructs ferry terminals with its own funds and offers low rates for users. Furthermore, the government is making efforts to develop ferry services on non-profitable routes, the called pioneer routes, to improve the lives of its people.

1-2 Organizations Responsible for Administering Ferry Transportation

1-2-1 Ministry of Communications

3. In Indonesia, the transportation of cargoes and passengers is supervised by the Ministry of Communications. Organization chart of the Ministry of Communications is shown in Fig. 1-2-1A.
4. The Ministry of Communications has three directorate generals corresponding to the three means of transportation, namely, Directorate General of Land Transport & Inland Waterways, Directorate General of Sea Communications and Directorate General of Air Communications.
5. Major functions of government in ferry port development are as follows:
 - a. Establishing the national ferry port policy
 - b. Review and coordination of ferry port planning
 - c. Financing ferry port development

- d. Undertaking port construction
- e. Establishment of technical standards
- f. Investigation of natural conditions

6. Directorate General of Land Transport & Inland Waterways has the central responsibility for ferry route administration at the national level. In addition, the Ministry of Communications has 27 regional offices. Regional office Heads are responsible for ferry port development at the regional level.

7. The head of a port (terminal), under the head of a regional office, is responsible for daily management such as the operation of public facilities, maintenance etc.

8. The construction of a ferry port is executed by a special agency (project manager) who is appointed by the Minister of Communications.

1-2-2 Directorate General of Land Transport and Inland Waterways (DGLT)

(1) History

9. In 1949, the Ministry of Public and Man Power was split into the Ministry of Public Works and the Ministry of Communications. Also, as the Land Motor Transportation Services (DADB) was placed under the Ministry of Communications with added duties to take care of river transportation, its name was changed to the Land Transportation and Rivers Services (DADS).

10. With Government Regulation No.16 in 1958, a part of the government's interest in Traffic and Roads Transportation (LLAJR) field was transferred to the provinces, and a LLAJR agency was established in ten provinces.

11. In 1966, Directorate General of Land Transportation and Inland Waterways (DGLT) was formed by a Governmental Cabinet Decision. At that time, the organization was composed of the Secretary of General Directorate, Traffic and Roads Transportation Directorate (Dit. LLADR) and Directorate of Vehicle Maintenance.

12. By the Presidential Decree No.44 and 45 in 1974, DGLT's organization was composed of the Secretary of General Directorate, Dit. LLADR, Directorate of Inland Waterways and Ferry Services(Dit LLASDP), Land Transportation Education & Training Central, Land Transportation Research & Development and Vertical Agency, such as the Regional Office of Directorate General of Land Transportation.

13. In 1980, Traffic and Directorate City Transportation (Dit. LLAK) was founded and was added to DGLT's organization. In 1988, the Regional Office of DGLT was absorbed by the Regional Office of MOC.

14. In 1989, DGLT's organization was changed in accordance with the Minister of Communications Decision No.23 in 1989 to the present one, which is shown in Fig. 1-2-2A.

(2) Organization of DGLT

15. As shown in Fig. 1-2-2A, DGLT is composed of the Secretary of the Directorate General and three directorates, the Directorate of Traffic and Transportation, Directorate of Infrastructural System Development and Directorate of Safety and Technique.

16. The number of personnel in DGLT is 642 at present.

17. DGLT supervises four public companies, Railways Services Company(PJKA), Perum Damri, Perum PPD and Perum ASDP.

18. PJKA operates passenger and freight transportation by trains in North Sumatra, West Sumatra, South Sumatra, Lampung and Java, including Jabotabek (Jakarta, Bogor, Tangerang, Bekasi) passenger transportation.

19. Perum Damri operates city transportation outside DKI Jakarta, inter city transportation, tourist transportation, airport transportation freight transportation and pioneer transportation in isolated areas. Perum Damri is increasing its city transportation services in Medan, Tanjung Karang, Bandung, Semarang, Yogyakarta, Solo, Surabaya, Ujung Pandan and Manado.

20. Perum PPD operates city transportation in Jabotabek area and also tourist transportation. Private companies also operate city transportation.

21. Perum ASDP operates ferry transportation on rivers, lakes and sea in all areas of Indonesia and terminal(port) branch services.

(3) Responsibilities of DGLT in Ferry Transportation

22. Before DGLT's reorganization in 1989, there was an integrated directorate to supervise ferry transportation. The present organization has been divided into three directorates, each with their respective function.

23. Sub Directorate of Inland Waterways & Ferry Transport in Directorate of Traffic and Transport is responsible for granting permission for ferry transportation including terminal services and management as well as supervising and providing technical guidance to management.

24. Sub Directorate of Inland waterways Terminal & Port in Directorate of Infrastructural System Development oversees the construction of ferry ports & terminals and provides technical guidance for the development, rehabilitation and maintenance of ferry ports & terminals.

25. Sub Directorate of Inland Waterways & Ferry Lines in Directorate of Infrastructural System Development provides technical guidance for mapping, planning of navigation aids and maintenance dredging and development of inland waterways and ferry lines.

26. Sub Directorate of Safety & Technique for Inland Waterways & Ferry Transport prepares technical guidelines for shipping operations and oversees shipbuilding and maintenance of ships.

27. The number of personnel engaged in ferry transportation sections of DGLT is 87 at present.

1-3 Organizations Responsible for Management/Operation of Ferry Transportation

1-3-1 General

28. Concerning the operation of ferry transportation, shipping is managed and operated by the Perum ASDP or private companies; ferry terminals are managed by terminal offices of either MOC or the Perum ASDP. The Perum ASDP manages and operates 10 terminals in five lines at present. Management bodies for the existing routes are shown in Table 1-3-1A.

29. The Perum ASDP operates not only benefit lines but also non-benefit lines. Benefit lines are called commercial lines and non-benefit lines are called pioneer lines.

1-3-2 The Perum ASDP

(1) History of the Perum ASDP

30. To facilitate the rapid growth required in the transportation sector during the first long-term development period(1969-1994), the government established the pioneer ASDP Project on 27th March, 1973 to improve the ferry service as part of the water transportation development.

31. At that time, river transportation was borne by the regional government and private companies in some regions which had a river/lake as the main means of transportation.

32. Ferry transportation was run by Railways Services, known as PJKA, as the means of transportation related to the railways transportation from Java to Sumatra, Madura and Bali through ferry service at Merak-Panjang, Ujung-Kamal and Ketapang-Gilimanuk. The construction and arrangement of the ferry transportation was conducted by the River and Land Transportation Service(DLLADS).

33. The water transportation development improved along with the road development as a ferry boat is also a part of road transportation, functioning as a floating bridge that connects the road with a river, lake, bay or strait.

34. ASDF Project was originally operated using four ships at Banjarmasin, Samarinda, Pontianak and Jambi in order to establish the public service river transportation at the end of the first long-term development program(Perita I).

35. With the Presidential decision No. 47 in 1979 (KEPPRES No.47/1979), the term "Ferry" was changed to an Indonesian term meaning "crossing". And since then, ASDF has been changed to ASDP.

36. By the Governmental Regulation No. 8 in 1986, ASDP Project was transferred to a public company.

(2) Organization and Operation of the Perum ASDP

37. The organization chart of the Perum ASDP is shown in Fig. 1-3-1A. The Perum ASDP is managed by four directors, all of whom are members of the board of directors.

- Managing Director
- Operation Director
- Engineering Director
- Administration and Finance Director

These directors are sent from the government.

38. There are 19 shipping branches under the Board of Directors. Shipping branches are classified into three grades. These are shown in Table 1-3-2A with operating routes. And the organization chart of shipping branch(Class I & II) is shown in Fig. 1-3-2A. "Representative" means a branch managed by the branch office. All shipping branch offices are not necessarily built at the port side, but most branch offices are in main cities where regional government offices and/or regional offices of MOC exist.

39. The Perum ASDP has 51 ships at present. Additionally, the Perum ASDP will be given 11 more ships from the government by the end of March 1993.

40. On the other hand, the Perum ASDP also manages and operates terminal services in main commercial lines. At present, the Perum ASDP manages and operates 10 terminals, but the number of terminal branches is seven as shown in Table 1-3-3A. An organization chart of a terminal branch is shown in Fig. 1-3-

3A and Fig. 1-3-4A. In the case of one branch on a shipping route, a branch office has a representative office at the other terminal.

41. The maintenance and rehabilitation of facilities are executed by the Perum ASDP, but new ships and new terminals are prepared by the government.

42. The number of personnel in the ASDP in 1991 is shown in Table 1-3-4A. Contract staff has a different salary system from regular staff, namely the salary of contract staff is less than that of regular staff. But contract staff can transfer to regular staff in three years.

43. The number of personnel in the Perum ASDP from 1987 to 1991 is shown in Table 1-3-5A. The number of personnel increases year by year because shipping services increase but mainly because the responsibility for terminal operations has been increasingly transferred to Perum ASDP, which absorbs the staff previously of MOC. Fortunately, as the Perum ASDP operates only commercially viable large terminals, terminal operations contribute to the improvement of the Perum ASDP's finances.

(3) Financial Aspects of the Perum ASDP

44. Shipping tariff and terminal tariff are all decided by the government. Shipping tariff is valid for the Perum ASDP and private companies with the same rates, and it can vary according to the route.

45. The Perum ASDP does not receive subsidies from the government, but all ships except for two ships used for replacement and terminal facilities managed by the Perum ASDP are provided by the government.

46. Profit and loss statements of the Perum ASDP are shown in Table 1-3-6A. Both operating revenues and net operating income have increased rapidly. Financial situation has been improving year by year.

47. Service lives of facilities, which are used in the calculation of depreciation with the straight-line method, are shown in Table 1-3-7A.

48. Operating and working ratios are usually used to indicate the financial

viability of the management body. Those of the Perum ASDP indicate 89% and 78% respectively in 1991. Unfortunately, the Perum ASDP can not be regarded as a viable management body because both of figures are beyond the criteria of IBRD, which stipulates less than 70-75% for operating ratio and less than 50-60% for working ratio.

1-3-3 Private Companies

49. Private companies first given business permits were PT. Dharma Lautan Utama and PT. JL. Ferry in 1976 in Ujung-Kamal route and Merak-Srengsem, respectively.

50. At present, fifteen private companies are operating ferry services in twelve routes. And, private companies operate in two routes exclusively.

51. The private companies mainly operate on commercial lines. A private company must obtain a business permit and an operation permit from the Minister of Communications. A business permit allows one to establish a ferry transportation company. An operation permit is given to a ferry transportation company allowing it to operate ferry transportation activities. An operation permit is given for five years and can be extended indefinitely provided the company does not violate any regulations regarding ferry transportation implementation. Operation permit for crossing route connecting two provinces is issued by Director General of DGLT in the name of the Minister of Communications. A crossing route in one province is issued by Head of Regional Office of Ministry of Communications in the name of Minister of Communications.

1-3-4 Terminal Office of Ministry of Communications

(1) Organization of Terminal Office of MOC

52. As mentioned above, a terminal office is supervised by a head of regional office of MOC. A typical organization chart of a regional office of MOC is shown in Fig. 1-3-5A. A head of terminal office is responsible for daily management such as operating and maintenance of terminal facilities.

53. Terminal offices of MOC are generally classified into three ranks. But, because management of offices in Class I have already been transferred to the Perum ASDP, there is no office in Class I in MOC.

54. Organization charts of terminal office (Class II & Class III) of MOC are shown in Fig. 1-3-6A and Fig. 1-3-7A.

55. In the case of Bajoe office (Class II) in South Sulawesi, the number of staff at the terminal office is 43 at present. In the case of Waipirit office (Class III) in Seram Island in Maluku, there are 11 staff members at present.

(2) Financial Aspects of the Terminal Office of MOC

56. In terminal offices of MOC in 1991, revenues and expenses are shown in Table 1-3-8A. This Table indicates the financial conditions in a part of terminal offices of MOC. In this Table, expenses exceed revenues in all offices. Regarding the Ratios of expenses and revenues, the biggest ratio is 42.5 in Cilacap office, and the smallest one is 1.2 in Panajam office as shown in Table 1-3-8A.

57. As mentioned above, the Indonesian government allocates a lot of funds to develop and operate ferry services to improve quality of life on isolated islands. The government maintains the cheaper rates for ferry terminals to achieve its purpose. In other words, the government supports the operations of shipping companies. That is the policy of the Indonesian government.

1-4 Present Situation of Ferry Transportation Activity

1-4-1 Ferry Transportation Network

58. There were 35 Ferry routes in operation as of 1990, as shown in Fig. 1-4-1A, and in Table 1-4-1A. Among the 35 routes 12 routes are "Inland" type or "Shortcut" type routes, in which services are provided crossing rivers and lakes, or for shortcut transportation in the same island. The other 23 are "Inter-Island" type routes.

59. The "Inland" type routes are mainly found in Sumatra Island or in Kalimantan Island. They are, for example, located around Jambi city or Pontianak city. In the "Shortcut" type routes, it can be noted that distance varies greatly, for example, the Poka-Galala route in Ambon Island has a distance of only 0.5 miles, while the Bajoe-Kolaka route in South Sulawesi has a distance of 80 miles.

60. The 23 "Inter-Island" type routes are classified by distance as follows;

Distance	Number of routes
10 miles or under	3 Routes
10 to 50	13
50 to 100	2
100 or over	5
Total	23 Routes

The longest route is Kupang - Kalabahi route, which has a distance of 137 miles.

61. Ferry services are operated either by the public sector(Perum ASDP) or by private sector. Fig. 1-4-2A shows the ferry boats presently operated by each of the sectors. The private sector's ferry services are mainly operated in the western regions of Indonesia including Kalimantan.

1-4-2 Ferry Transportation Traffic Volume

(1) Traffic Volume on Each Route

62. Table 1-4-2A through Table 1-4-5A show the ranking of the 35 routes based on the transportation item and the level of the service in 1990. Table 1-4-2A shows the ranking based on the passenger transportation volume. Table 1-4-3A shows the ranking based on the cargo transportation volume. Table 1-4-4A shows the ranking based on the transportation volume of four-wheeled vehicle. Table 1-4-5A shows the ranking based on the frequency of service.

These rankings by each item are illustrated in Fig. 1-4-3A through Fig. 1-4-6A.

63. From these data, some characteristics are noted as follows:

- a. Four top-ranked routes such as Ujung-Kamal route, Merak-Bakauheni route, Ketapang-Gilimanuk route and Padangbai-Lember route, have large traffic volume in each transportation item.
- b. Two top-ranked routes such as Poka-Galala route and Pontianak City route have large traffic volume in passenger transportation but very small volume in cargo transportation.
- c. The two study routes, Hunimua-Waipirit route and Bajoe-Kolaka route, have the same ranking in terms of passenger traffic volume and for the transportation of four-wheeled vehicle, but Bajoe-Kolaka route has a much larger volume of the cargo traffic.

(2) Transportation Volume on Each Route

64. In Table 1-4-6A, the transportation volume per one trip of ferry of passenger, cargo, and four-wheeled vehicle on each route are shown. These data are shown in Fig. 1-4-7A through Fig. 1-4-9A.

Passenger transportation volume per one trip on each route are shown in Fig. 1-4-7A. Average transportation volume per trip on 35 routes is calculated at 104 persons. Number of routes which has a transportation volume over 100 persons per trip is 12, about one third of the all routes.

65. Among the four study routes, the three routes of Bajoe - Kolaka, Bangka-Belitung and Palembang-Kayuaran, have a transportation volume over 100 persons per trip. The Hunimua-Waipirit route has a nearly equal transportation volume to the average volume which is 94 persons per trip.

66. In Fig. 1-4-8A, transportation volume of cargo are shown. Average transportation volume is calculated at 11 tons per trip. Number of routes which has a transportation volume over 10 tons per trip is 8, about one forth of the all routes. Among the four study routes, only Bajoe-Kolaka route has a transportation volume over 10 tons, which is 25 tons per trip.

67. In Fig. 1-4-9A, transportation volume of four-wheeled vehicle are shown. Average transportation volume is calculated at six vehicles per trip. Number of routes which has a volume over six vehicles per trip is 10, including

Bajoe-Kolaka route belongs with a volume of eight vehicles per trip. Hunimua-Waipirit route has a volume of five vehicles per trip.

68. From those data mentioned above, it can be concluded that comparing with the average capacity of the ferry boat in operation, except for several routes, the transportation volume per trip is rather small in general, and it is notable especially in the volume of cargo and four-wheeled vehicles rather than passengers.

In other words, it can be said that the main role of actual ferry service is the passenger transportation rather than the cargo transportation except for several major routes.

(3) Kinds of Commodity

69. The cargo volume by commodity transported by ferry is shown in Table 1-4-7A and Fig. 1-4-10A. The top-ranked ferry cargo is livestock and raw food material, accounting for 23% of all the cargoes(1988). The second-ranked cargo is general cargo with a share of 17%, and the third is food, drink, and raw material of cigarette with a share of 16%.

70. In the same table and in Fig. 1-4-11A, conventional sea transportation cargo volume is also shown. In the conventional sea transportation, general cargo is also ranked at the top, with a share of 31%. The second-ranked cargo is natural processed fertilizer, with a share of 14%. The third is food, drink and raw material of cigarette with a share of 10%. The forth is cement, with a share of 9%. The fifth is livestock and raw food material with a share of 8%.

(4) Seasonal Variation of Transportation Volume

71. The seasonal(monthly) variations of the passenger traffic in 1990 are studied on the Merak-Bakauheni route and four study routes. These variations are shown in Table 1-4-8A and in Fig. 1-4-12A. The peaks of traffic are in "Lebaran" month(April), June, July and during Christmas and the New Year season on almost every route. Of the above five routes, the highest peak ratio of 1.98 is seen on Pankalbalam-Tanjung Pandang route. On the Kupang-Larantuka route, the peak ratio shows a value of 1.83. In the other routes, the ratio ranges from 1.13 to 1.38.

1-4-3 Transportation O-D of Ferry Service and Other Transportation Modes

(1) Passenger

1) Nationwide O-D Analysis

72. Based on the O-D survey conducted by MOC in 1988, nationwide passenger's O-D in each transportation mode are shown in Table 1-4-9A through Table 1-4-14A. They are also shown in Fig. 1-4-13A to Fig. 1-4-19A.

In this analysis, Indonesia is divided into six zones, as usually used.

73. Ferry passengers' O-D are shown in Table 1-4-9A and Table 1-4-10A. More than 90% of the total surveyed traffics is seen originated from and destined to Sumatra island(A), Jawa island(B) and Bali & Nusa Tenggara(C).

The most dominant flow of traffic is seen in the direction from Jawa island to Jawa island (intra-island traffic), followed by Jawa island(B) to Sumatra island(A), Sumatra island(A) to Jawa island(B), Bali Nusa Tenggara(C) to Jawa island(B) and Jawa island(B) to Bali & Nusa Tenggara(C). These five sections occupy 93% of all the surveyed traffic volume.

74. The passengers' O-D by conventional sea transportation is shown in Table 1-4-11A and Table 1-4-12A. As compared with ferry passengers' O-D, origins and destinations of passengers by conventional sea transportation are seen much more widely distributed.

75. Air passenger's O-D are shown in Table 1-4-13A and Table 1-4-14A. Passengers' O-D are seen widely throughout the country.

2) Hinterland Analysis

76. Based on the O-D survey, ferry passenger's O-D are analyzed in more detail for study routes and some other routes. The purpose of this analysis is to determine the hinterland of the ferry passengers. The analyzed routes are as follows, and the results are shown in Fig. 1-4-20A through Fig. 1-4-31A.

* Hunimua-Waipirit route : Fig. 1-4-20A - Fig. 1-4-21A

- * Kupang- route : Fig. 1-4-22A
- * Kalabahi-Kupang route : Fig. 1-4-23A
- * Larantuka-Kupang route : Fig. 1-4-24A
- * Bajoe- Kolaka route : Fig. 1-4-25A - Fig. 1-4-27A
- * Bangka-Belitung route : Fig. 1-4-28A - Fig. 1-4-30A
- * Bangka-Palembang route : Fig. 1-4-28A - Fig. 1-4-29A
- * Palembang- route : Fig. 1-4-31A

77. The following findings were obtained, concerning the hinterland of each route.

- * Except for the routes of Bangka-Belitung and Bangka-Palembang, the passengers' hinterlands are very limited in area; more than 90% of the passengers are moving within the Kabupaten or at most within the province where they live.
- * On the other hand, in the case of the above excluded routes, the passengers' hinterlands are spread more widely. The 28% of the passengers originated from Kabupaten Bangka are destined outside of their residential province (Fig. 1-4-16A). Many of them go to Jawa Island. The 34% of the passengers from Kodya Pangkal Pinang are also destined out of their province (Fig. 1-4-17A).
- * In case of the passengers from Kodya Palembang, only 10% of them move within their province, while nearly 90% of them go out of their province (Fig. 1-4-19A).

(2) Cargo

1) Nationwide O-D Analysis

78. Nationwide ferry cargo's O-D is shown in Table 1-4-15A, Table 1-4-16A, and Fig. 1-4-32A. Main traffic flow are seen originated from and destined to Sumatera island(A), Jawa island(B) and Bali, Nusa Tenggara(C). Among them, Sumatera island and Jawa island are the prominent origins and destinations of the surveyed traffic.

79. Analysis of cargo's O-D in nationwide conventional sea transportation is shown in Table 1-4-17A, Table 1-4-18A, and Fig. 1-4-33A. Main traffic flow are

seen originated and destined to Sumatera island(A) and Jawa island(B), and fairly large traffic flows are from/to Jawa island(A), Kalimantan(D), and Sulawesi island(E).

2) Hinterland Analysis

80. The destination of cargoes from three provinces which are ranked No.one to No.three in the volume of cargo origination are shown in Table 1-4-19A and Fig. 1-4-34A through Fig. 1-4-36A.

In general, cargo traffic distance is not so long. About 50%, or more of the total cargoes are destined to the proximate provinces.

81. The 68% of the ferry cargo from Lampung province(18) are destined to the nearest province, DKI Jakarta. The 47% of the cargo from DKI Jakarta are destined to the nearest province, Lampung. In the case of Jatim, 54% of the cargo are destined to province, Bali, and 32% of the cargo are moving within Jatim province.

Chapter 2 Socio/Economic Features, Road Conditions and Transportation Activities in the Proposed Ferry Route Development Areas

2-1 Ambon - Seram Route

2-1-1 Socioeconomic Features

1. This route is in Maluku Province. Maluku Province consists of 4 Kabupatens and kot.Ambon. Proposed sites are located in Ambon island and Seram island of Kabupaten Maluku Tengah.

The source for this section comes from "Dalam Angka 1990".

(1) Population

1) Maluku Province

2. Maluku province often called as "thousand islands Province", has a total area of 851,000 km² (ocean 765,272 km² and land 85,728 km²). The Population in Maluku Province was 1,857,970, consisting of 946,868 men and 910,922 women in 1990. The rate of population growth during 1980-1990 was 31.68% or an average of 2.88% per year, the growth rate during 1989-1990 was 2.43%. (See table 2-1-1A)

2) Kabupaten Maluku Tengah

3. The census taken at the end of 1990 showed that the population in Kabupaten Maluku Tengah was 591,066, consisting of 302,174 men and 288,892 women. The area of Kabupaten Maluku Tengah according to the census was 29,218 km². The density of population in the area was about 20 people per km². The average number of people in a family is 5 people. There were many people who lived in Seram and Ambon islands.

4. Kot.Ambon is the bustling commercial and administrative hub of Maluku with 276,280 inhabitants. The relating places to Ambon as its hinterland are Piru, Kairatu, Amahai, Tehoru, Wahai, and Bula in Seram island, Buru island and Geser island. The number of people in Ambon island was 367,790 and increased at 112.7% during 1987-1990. Its rate is higher than that of Maluku Province

5. Seram island covers 18,410 km², about half the size of the Netherlands. The island stretches 340 km from east to west. Most areas of the island are densely wooded, mountainous but not volcanic. About 315,000 people in Seram population concentrated in the west and almost entirely along the coasts.

(2) Industry

1) Maluku Province

6. Most people in Maluku Province live on fishing and agricultural products such as vegetables, bananas, yams, cassava and sweet potatoes.

The cash economy is based on copra, dried coconut meat. Large companies are exploiting the islands' timber resources, processing logs into sawn planks and plywood. The seas yield important harvests of tuna, shrimp, mother-of-pearl shells and pearls. It is also the main attraction of Maluku Province.

7. In the area of agriculture, Maluku area is known for its production of spices such as clove, nutmeg, and dried-coconut. The development commodity is cacao and coffee. Seram and Halmahera are used as transmigration locations, the agricultural production for domestic consumption is sufficient, although rice is still sent from Ujung Pandang.

8. In the forestry sector, several types of wood can be found in Maluku, namely morantee, gopassa, iron wood, nani wood, linggua wood, etc. Morantee accounts for 38.3%, iron wood 28.8%, linggua wood 10.3%, gopassa 10.2%, others 12.4%. Other forest production includes rattan, restin white wood oil, lawang oil.

9. In the area around Maluku territory, many pelagic fish are caught. The fish product potential in Maluku territory is 1.9-2.5 ton/km²/year or 3 times that of the Indonesia's production. Another sea product that has export potential is shrimp that is found around Aru island and Kao bay. The sea products currently exported are tuna fish, wet-shrimp, sea weed, black lips shell, sea cucumber and pearls.

2) Kabupaten Maluku Tengah

10. The agriculture sector is still the most dominant sector in Kabupaten Maluku Tengah. Crop production in Kabupaten Maluku Tengah during the period of 1986 - 1990 steadily increased. The development of sawah paddy field in 1990 yielded 23,312 tons with 4,063 ha harvesting area which meant that the average production was 5.7 tons/ha. Other crops commodity in 1990 increased over production in 1989. They are: corn 146.76%(2,205 to 5,441 tons), cassava 171.54%(35.645 to 96.793 tons), sweet potato 15.39%(10,774 to 12,432 tons), beans 29.42%(1,574 to 2,037 tons), small green peas 18.53%(572 to 678 tons), other varieties of beans 255.38%(65 to 231 tons).

11. In the sector of Plantation Crops, coconut, clove, nutmeg, coffee and cashew are the main commodities. Among these crops, nutmeg reached first. It is noted that there were 33,790 families who engaged in home cultivation of nutmeg, the width of the area was 35,351 ha.

12. In the sector of Forestry, Seram island has the widest area, of 1,985,877.60 ha. Of the 12 logging companies in Kabupaten Maluku Tengah, all are located in two islands: Seram island and Buru island. In Seram island there are 9 companies and in Buru island 3 companies. Gema Sanubari company in Buru island commands the widest area(305,000 ha) among the companies.

13. In the sector of Fishery, Kabupaten Maluku Tengah has a potential fishery. This can be seen from the varied fishery business operated in this area which exploit the sea sources in order to gain foreign exchange and to increase the income of the Kabupaten and to improve the income of the fishermen. The total production of fresh sea fish in Kabupaten Maluku Tengah in 1990 was 34,320.3 tons amounting to a total value of 10,858.489 million rupiah. During 1986 - 1990, production increased. In 1986 the production was 30,404.6 tons and increased to 34,320.3 tons or at 112.88% in 1990. The value of production was increased to 10,858.489 million rupiah or at 136.60% from 7,949.049 million rupiah.

(3) Gross Regional Domestic Product (GRDP)

1) Maluku Province

14. The GRDP in Maluku Province in 1989 based on current prices was 1,332,560,946 thousand rupiah which meant that compared to 1988 (130,027,366 thousand rupiah) it increased at 117.92%.

The growth of GRDP of 1989 increased at 278.38% compared with that of 1983. (See Table 2-1-2A)

15. Realistically, the development of GRDP was based on the constant 1983 prices. The productivity of 1989 increased to 162.61% compared with that of 1983. The productivity of the years before compared with that of 1983 was as follows: 140.78% in 1987, 153.42% in 1988 and 162.61% in 1989. The rate of development in previous years in Maluku Province were as follows : 7.33% in 1988 and 17.92% in 1989. The biggest contributor to GRDP is the sector of agriculture. The percentage of the sector of agriculture was as follows: 43.05% in 1987, 41% in 1988, 36.22% in 1989.

2) Kabupaten Maluku Tengah

16. In Kabupaten Maluku Tengah, GRDP in 1989 based on the current prices was 312,839,274 thousand rupiah which meant that compared with 1988 (272,413,122 thousand rupiah) it increased at 114.84%. The growth of GRDP in 1989 increased at 259.56% compared with that of 1983. In 1986, the growth of GRDP compared with 1983 was 145.65%, 194.38% in 1987, 226.02% in 1988 and 259.56% in 1989. The rate of growth of GRDP in previous years was as follows: 14.84% in 1989, 16.28% in 1988 and 33.45% in 1987. (See Table 2-1-3A)

17. In 1989, based on the constant 1983 prices which was 194,942,000 thousand rupiah, the productivity increased at 161.74% compared with that in 1983. The growth of GRDP compared to that of 1983 was as follows: 126.23% in 1986, 143.35% in 1987, 153.86% in 1988 and 161.74% in 1989. The rate of development in the previous years in Kabupaten Maluku Tengah was as follows: 5.12% in 1989, 7.33% in 1988 and 13.56% in 1987.

18. The growth of real economy (constant price of 1983) in Kabupaten Maluku

Tengah mentioned above cannot be separated from the growth in each sector. The business activities of the people of Kabupaten Maluku Tengah varied but are dominated by the sector of agriculture.

The biggest contributor to GRDP is the sector of agriculture. The percentage of the sector of agriculture was as followed: 46.61% in 1986, 43.05% in 1987, 41% in 1988, 40.50% in 1989.

19. Among the many indicators, there is one indicator to measure the level of prosperity of an area. It is the income per capita.

In 1983, the income per capita of Kabupaten Maluku Tengah was Rp. 235,797 and in 1989 was Rp. 524,563, an increase of 222.46%. The development of each year compared with 1983 is as follows: 113.04% in 1984, 125.79% in 1985, 134.57% in 1986, 173.94% in 1987, 197.04% in 1988, 222.46% in 1989.

20. The real regional income per capita without any effect of the increasing price is shown by the counting of the regional income per capita based on the constant price of 1983. It was Rp. 235,797 in 1983 and Rp. 326,502 in 1989, an increase of 138.47%. In 1984 there was an increase of 103.20%, 108.10% in 1985, 116.69% in 1986, 128.20% in 1987, 133.81% in 1988 and 138.47% in 1989.

(4) Road Conditions and Number of Vehicles

21. The transportation can be useful in activating other sectors. The aim of the development is to improve the East part of Indonesia including Maluku Province. Transportation, then, become one of the main priorities because Maluku province is well known for its "thousand islands". Its development will unite and strengthen the area and also expedite the transportation of freight and service as well as the people.

22. Maluku Province has three types of roads, state road, provincial road and kabupaten road, their respective lengths are 395.07 km, 1,186.44 km and 2,580.00 km. Concerning the road condition, from the total road network of 4,161.51 km, 1,023.49 km or 24.60% is in good condition, 2,255.88 km or 54.23% is moderate, 668.09 km or 16.05% is damaged, and 213.23 km or 5.12% is heavily damaged. Concerning the road surface 2,078.41 km or 49.49% is asphalt, 1,100.11 km or 26.44% is gravel, 770.16 km or 18.51% is earth. (See Table 2-1-6A)

23. Road length in Kabupaten Maluku Tengah (1990) is 789.5 km. Compared with 1989 when road length was 715.5 km, it has increased at 110.34 %. During 1985-1990, road length increased at 199.97%. In terms of the road condition, 190.0 km or 24.07% is in good condition, 324.5 km or 41.10% is in moderate condition, 207.0 km or 26.22% is damaged and 68.0 km or 8.61 % is seriously damaged. Concerning the road surface, asphalt covers 462.5 km or 58.58%, which is an increase of 107.68% over to 1989(429.5 km) and gravel covers 327 km or 41.42%. In Kotamadya Ambon (1990), road length is 232.17 km. In terms of the road condition, 112.65 km is in good condition, 64.70 km is in moderate condition, 39.52 km is damaged and 15.30 km is heavily damaged. In terms of road surface, asphalt covers 182.75 km(78.71%). (See Table 2-1-7A)

24. The number of vehicles in 1990 in this province is 25,984, composed of 3,949 passenger cars, 5,245 trucks, and 16,800 motorcycles. The number of the vehicle in 1990 compared to 1989 decreased by 42.18% or from 44,943 in 1989 to 25,984 in 1990. In Kabupaten Maluku Tengah total number of cars is 1,843, that is 25 passenger cars, 519 trucks and 1,299 motorcycles. (See Table 2-1-9A - 2-1-10A)

2-1-2 Transportation Activities

(1) Air Transportation

25. The capital city of Maluku province, "Ambon", is connected directly or indirectly to the other main cities in Indonesia by domestic airline service. As for the connection of Ambon Island and Seram Island, there is no regular air transportation service.

26. Based on Air Transport Statistics(1990), traffic volume handled at Ambon are as follows;

Passenger	Departure	72,024	Cargo	Loaded	588,646 kg
	Arrival	57,547		Unloaded	856,990
	Transit	36,019			

About 60% of departure or 42,745 passengers went to Ujung Pandang and 5,111 passengers went to Blak. Concerning arrival, 14,219 passengers came from Sorong, 13,603 from Ujung Pandang and 6,395 from Ternate.

(2) Sea Transportation

1) Ferry Transportation

27. The ferry service between Ambon island and Seram island is operated both by the Perum ASDP and a private operator, "P.T. Bangun Samudera Maluku". The service connects Hunimua and Waipirit which covers a distance of 11 miles.

28. Each operator owns one Ro-Ro type ferry boat, a 142 GRT(RT)(Perum ASDP) and a 193 GRT(RT). The passenger capacities are 100 and 250 persons respectively. The Perum ASDP's boat has a capacity of 8 vehicles.

29. The daily frequency at present is 6 round trips, or 12 trips/day. It takes about 70 minutes for a trip of 11 miles at a speed of 10 knots.

30. The user's purposes of trip are known from the result of the "Questionnaire Study", conducted by the Study Team. The results are as follows;

- * 41% of the passengers are visiting their relatives.
- * 33% of the passengers are on business related matters.
- * 8% of the passengers are on tour/recreation.
- * 5% of the passengers are for school(student).
- * Others include shopping, visiting hospital, etc.

It is understood that the Hunimua-Waipirit route is used mainly for "Daily-Life Purposes".

31. The transportation volume in the past years are shown in Table 2-1-11. From this Table the "Loading-Factor" (Ratio of the actual use to the capacity of the boat) of the route is obtained. The passenger volume for one trip in these 6 years is calculated at 79 to 107 persons, and at 93 persons as an average. The average passenger capacity of the two boats is calculated at 175 persons($(100+250)/2=175$), so the passenger's "Loading-Factor" will be 53%(93/175).

32. The vehicle's "Loading Factor" is calculated in a similar way. The number of vehicles for one trip in these years is 2.2 to 4.1, with 2.9 as an average. The vehicle's "Loading Factor" will be 29%(2.9/10), assuming that the average capacity of the two boats is 10 vehicles.

33. The monthly transportation volume recorded in 1991 is shown in Table 2-1-12A. From this Table the seasonable variation in the transportation volume is known. Concerning the passenger volume, the peak of volume is seen during December-January, and the other peaks are seen during March-April and in June-July. The variation ratio of each month, which is the ratio of the monthly volume to the annual average volume is calculated at 0.82 to 1.13.

2) Conventional Transportation

34. The sea transportation service network between Ambon Island and Seram Island is shown in the Fig. 2-1-1. Small passenger boats with sizes ranging from 20 to 50ton are operated by the local people.

35. On the Tulehu-Amahai route, six small boats are in operation and four small boats are in operation on Tulehu-Tehoru route. The capacities of the boats are 50-100 passengers. The frequency of the service is 6 rounds/day on the former route and 4 rounds/day on the latter.

36. The passenger transportation volume on these routes(ports) are shown in Table 2-1-13A and in Fig. 2-1-2A. These data indicate that the two routes mentioned above, as well as the ferry route, are the main routes for the transportation of passengers between the two islands.

2-2 Biak - Yapen - Irian Jaya Route

2-2-1 Socioeconomic Features

37. This route is in Irian Jaya Province. Irian Jaya Province consists of 9 Kabupatens and Kot. Jayapura. Proposed sites are located in Biak island of Kabupaten Biak Numfor, in Yapen island of Kabupaten Yapen Waropen and at Nabire in Kabupaten Paniai respectively.

The source for this section comes from "Dalam Angka 1990".

(1) Population

1) Irian Jaya Province

38. The population of Irian Jaya in 1989 was 1,591,830 people consisting of 816,913 men and 774,917 women with an average density rate at 3.84 people per km². Jayapura has the largest population(22.01%), and Kabupaten Yapen Waropen has the smallest 3.89%. Biak Numfor, with 28.0 people per km², has the largest density rate. (See Table 2-1-1A)

39. The average annual rate of population growth is 1.78% during 1986-1989 and 2.11% during 1988-1989. Compared with the national population growth in the same period 1.86% /year, the population growth rate of Irian Jaya was quite high. It was caused by the migration from others provinces to the development project for the transmigration settlement at Irian Jaya province. In addition to this, the Family Planning Program has not yet had effective results.

40. The aim of the transmigration housing development is to create even distribution in national population growth. The main purpose of the transmigration program development is to decrease "population growth"/"population pressure" in certain areas of Indonesia and to distribute development throughout the country to create a harmonized growth rate. The transmigration placement program in Irian Jaya Province up to 1989 have reached 13,872 household or 58,436 people. 1,387 households (6,216 people) are local transmigrant. Transmigration housing can be found in 5 kabupaten, Sorong, Manokwari, Paniai, Jayapura and Merauke.

2) Kabupaten Biak Numfor

41. The population in Kabupaten Biak Numfor in 1990 was 90,904 people and the average density was 29.0 people per km². The rate of population growth during 1986-1990 was 10.29% per year and 3.71% during 1989-1990. Biak Kota has the greatest share in population distribution(53.68%). The highest population density is in Biak Kota (104.9 people per km²). The population in Biak island in 1990 was 75,343 people and the average density was 34.1 people per km². The rate of population growth during 1986-1990 was 12.43% per year and 5.02% during 1989-1990.

3) Kabupaten Yapen Waropen

42. The population in Kabupaten Yapen Waropen in 1990 was 67,129 people and average density was 3.5 people per km². The population growth from 1986-1990 was 13.02% per year and 8.84% during 1989-1990. South-Yapen had both of the highest population (28,989) and the highest density average (46.4 people per km²). The population in Yapen island in 1990 was 50,766 and the density average was 24.8 people per km². The population growth during 1986-1990 was 14.33% per year and 10.55% during 1989-1990.

4) Kabupaten Paniai

43. The population in Kabupaten Paniai in 1990 was 223,337 people and the average density was 4.9 people per km². The population growth during 1986-1990 was 4.5% per year. During 1989-1990, that decreased to 0.84% or 1,891 people. Nabire had the largest population (17%, 38,411 people) in this Kabupaten.

(2) Industry

1) Irian Jaya Province

44. In agriculture, the main commodities of Irian Jaya are cassava, taro, sweet potato. Rice, corn, taro, nut, green bean, and vegetables are also grown. In 1989 production was highest in sweet potato(348,108 tons) which increased by 117.30% compared with 1988. The production volume in the agricultural sector

in Irian Jaya is as follows: rice = 57,395 tons, fruits = 42,444 tons and vegetable = 34,914 tons.

45. In the plantation sector, coconut, nutmeg, cacao, coffee, clove and rubber are the main commodities. Coconut is the prominent plant. The volume of coconut harvested was 10,245 tons in 1989, an increase of 257.41% over 1985(3,980 tons). Recently, production of nutmeg and clove has increased.

2) Kabupaten Biak Numfor

46. Corn, cassava, sweet potato, nuts and taro are grown at Biak Numfor. The taro production(3,355 tons) has the largest volume. The food production at Biak Numfor is still limited to second-crop commodities. Staples like rice are not planted here, but rather come from other areas.

47. The plantation activity at Biak Numfor is formed in the populace plantation. Clove, coconut, coffee and cotton are planted here. Coconut is the prominent plant and the production of coconut is 108 tons, using 1,987.5 ha.

3) Kabupaten Yapen Waropen

Production at Yapen Waropen consists of corn, cassava, sweet-potato, nuts and taro. A small volume of rice is also harvested. The production of sweet-potato is 1,274 tons with 224ha or 5.69 tons/ha. The plantation activity is reserved excluding for coconut. The coconut production(225 tons in 1989) is sufficient for local consumption or marketing in local area.

4) Kabupaten Paniai

48. Paniai is the main rice producer harvesting 2,690 tons in 1989. The other major product is sweet potato (96,684tons). The high level of food production in this kabupaten has made it attractive for transmigration settlements.

(3) Gross Regional Domestic Product (GRDP)

1) Irian Jaya Province

49. The GRDP in Irian Jaya Province in 1989 at current prices was 2,046,693.24 million rupiah which is an increase of 18.19% compared with 1988 (1,731,635.89 rupiah). The growth of GRDP of 1989 increased 240.18% compared with that of 1983. (See Table 2-2-1A)

50. At constant 1983 prices, the GRDP of 1989 increased to 133.56% compared with that of 1983. The growth rate compared with 1983 was 8.40% in 1988, 23.70% in 1989 and 33.56% in 1990. The mining sector accounted for the highest share of GRDP, 359,056.33 million rupiah or 31.55% and the second was the sector of agriculture (20.27%).

2) Kabupaten Biak Numfor

51. In Kabupaten Biak Numfor, GRDP in 1990 at current prices was 106,480.47 million rupiah which meant that compared with 1989 (89,430.31 million rupiah) it increased by 19.07%. The growth of GRDP in 1990 increased to 371.88% compared with that of 1983. The growth of GRDP compared with 1983 was 88.22% in 1986, 101.39% in 1987, 133.03% in 1988, 212.34% in 1989 and 271.88% in 1990. The rate of growth of GRDP in previous years was as follows: 19.07% in 1990, 34.03% in 1989, 15.71% in 1988 and 6.99% in 1987. (See Table 2-2-2A)

52. Based on the constant 1983 prices, the productivity of 1990 increased to 61.74% compared with that of 1983. The productivity of the years before compared with that of 1983 was as follows: 47.31% in 1986, 57.35% in 1987, 78.87% in 1988, 127.64% in 1989 and 156.38% in 1990. The rate of development in the previous years was as follows: 12.62% in 1990, 27.38% in 1989, 13.57% in 1988 and 6.81% in 1987. The biggest contributor to GRDP was the sector of transportation and communication. The percentage of the sector of transportation and communication was 26.80% in 1990 and next was the sector of agriculture which was 23.38%.

3) Kabupaten Yapen Waropen

53. In Kabupaten Yapen Waropen, GRDP in 1990 based on the current prices was 44,249.72 million rupiah which meant that compared with 1989(37,874.31 million rupiah) it increased by 16.83%. The growth of GRDP of 1990 increased to 212.65% compared with that of 1983. In 1986, the growth of GRDP compared with 1983 was 138.01%, 146.96% in 1987, 175.98% in 1988, 212.65% in 1989 and 248.45% in 1990. The rate of growth of GRDP in previous years was as follows: 16.83% in 1990, 20.84% in 1989, 19.75% in 1988 and 6.49% in 1987. (See Table 2-2-3A)

54. In 1989 based on the constant 1983 prices, the productivity of 1990 increased to 177.25% compared with that in 1983. The productivity of the years before compared to that of 1983 was as follows: 112.29% in 1986, 119.08% in 1987, 136.23% in 1988, 160.42% in 1989 and 177.25% in 1990. The rate of development in the previous years in Kabupaten was as follows: 10.49% in 1990, 17.77% in 1989, 14.39% in 1988 and 6.05% in 1987. The biggest contributor to GRDP is the sector of government. The percentage of this sector was 41.86% and the sector of agriculture was 19.06%.

4) Kabupaten Paniai

55. In Kabupaten Paniai GRDP in 1990 based on the current prices was 111,567.80 million rupiah which meant that compared with 1989(104,369.54 million rupiah) it increased by 106.90%. The growth of GRDP of 1990 increased by 229.69% compared to that of 1983. In 1989, the growth of GRDP compared with 1983 was 214.87%, in 1988 it was 121.54%, 1987 was 154.03% and 1986 was 127.36%. The rate of growth of GRDP prior to 1990 was 6.90%. (See Table 2-2-4A)

56. In 1989 based on constant 1983 prices, the productivity in 1990(67,280.75 million rupiah) increased by 138.51% compared with that of 1983. The productivity of the years before compared with that of 1983 was as follows: 106.23% in 1986, 113.52% in 1987, 121.54% in 1988, 139.0% in 1989 and 138.51% in 1990. The rate of development in the previous years in Kabupaten was as follows: -0.78% in 1990 and 14.86% in 1989. The biggest contributor to GRDP is the sector of agriculture. The percentage of the sector of agriculture was 40.82%.

(4) Road Conditions and Number of Vehicles

57. The transportation network in this area is still lags behind in quality or quantity of the means and infrastructure. It has a detrimental effect on the development and the improvement of the economy in regional.

58. The type and length of road in 1989 are as follows: state-road - 545 km, provincial road - 1,635.18 km, and kabupaten road - 2,837.44 km. Of the total road surface, 1,076.42 km or 21.06% is covered by asphalt, 1,773.97 km or 34.71% by gravel and 2,259.88 km or 44.22% by earth. Road length in Kabupaten Biak Numfor (1990) is 479.37 km. Compared to 1989 when road length was 331.90 km, it has increased by 144.43 %. Concerning the road condition, 158.58 km or 33.08 % is in good condition, 126.65 km or 26.42 % is in moderate condition and 194.14 km or 40.50 % is in damaged condition. In 1990, road length in Kabupaten Paniai is 756.71 km. Concerning surface condition, 96.82 km (12.79 %) is asphalted road, 210.64 km (27.84 %) gravel road, 449.13 km (59.35 %) earth road and there is no data on other roads. In terms of road condition, 47.00 km (6.21 %) is in good condition, 244.21 km (32.27 %) is moderate, and 463.70 km (61.28 %) is damaged. (See Table 2-2-5A to 2-2-8A).

59. There were 44,082 vehicles in this province in 1984, 5,967 passenger cars, 4,036 mini-buses, 4,713 cargo-cars, and 29,366 motorcycles. Compared with 1988(36,946) the number of vehicles has increased at 119.31%. (See Table 2-2-9A)

2-2-2 Transportation Activities

(1) Air Transportation

60. Biak city is on the network of the international air flight service and the international networks are connected not only to the United States(Los Angeles) but also to several major European cities, such as Amsterdam, Frankfurt, London, Paris, etc.

61. Biak is on the main route of the domestic flight networks and works as a center of the pioneer(PERINTIS) air networks in the Irian Jaya region. PT. MERPATI NUSANTARA AIRLINES works for such pioneer domestic services. As for the connection to Yapen island(Serui City) and to Nabire City, there is a once daily round flight service (9 flight services/week) in operation.

62. From Serui city there are fewer flight services to the other cities. Except for the connection to Biak city, there is only one flight service, which connects to Jayapura.

From Nabire city there are some pioneer flight services to the other places in Irian Jaya such as Fak Fak, Wamena, etc.

63. For these pioneer flight services, small air crafts with the capacity of 20 persons are used in general.

64. According to the O-D survey conducted by MOC in 1988, the volume of passenger transported by airplane is as follows:

Kab.Biak Numfor - Kab.Yapen Waropen	5,659 persons/year
Kab.Biak Numfor - Kab.Paniai	2,105 persons/year
Kab.Yapen Waropen - Kab.Paniai	411 persons/year

65. Based on Air Transport Statistics(1990), traffic volume handled at Biak are as follows;

Passenger (Departure) 54,577 Cargo (Loaded) 1,078,748 kg

About 26% of departure or 13,980 passengers went to Jayapura, 7,787 passengers went to Ujung Pandang and 5,668 passengers went to Serui. At Nabire, 4,544 passengers came from Biak and 28 passengers from Serui.

(2) Sea Transportation

66. In the study area there are five liner ships in operation, whose networks are shown in the Fig. 2-2-1A. Among the five liner ships, four ships are designed for cargo transportation, but the 350DWT size ship, which belongs to the government ship operator "PELNI" also transport passengers. The sizes of these ships range from 100DWT to 350DWT, and the frequencies depend on their own service network, varying from one round/week to one round/month.

67. For passenger use, one 1,400DWT size ship with the capacity of 915 persons is in operation by PELNI. The ship starts its journey from Jakarta, goes to Jayapura after visiting Biak, Serui and Nabire, and returns along the same course. It takes 4 weeks for one round trip.

68. The passenger volumes of the two PELNI's ships are as follows;

- * The average passenger transportation volume of the 350DWT ship is about 100 persons for one trip, transporting about 25 persons between Biak and Serui.
- * The 1,400GRT ship "SIRIMAU" started her service from May 1991 and transports nearly 1,200 persons in the peak seasons such as Christmas and the New Year, or in June and July. The ship usually transports about 200 persons from Biak to Nabire and about 40 persons From Biak to Serui.

69. The passenger volume and purpose of trip of "SIRIMAU" at Nabire on 13th February '92 were as follows;

- * 312 passengers went on board. Among them 217 passengers were headed for Jayapura and 95 passengers were headed for Serui.
- * By interviewing 23 passengers, it was learned that only one person was there on business, and the others were for "Visiting Family or Relatives".

70. In Table 2-2-10A, the passenger and cargo volume records of the three ports are shown. Concerning the cargo, Biak port handles the largest volume followed by Serui port. Concerning the passengers, there is no difference in the transportation volume between Biak port and Serui port.(There might be some imbalance in the data collection.)

2-3 Flores - Alor Route

2-3-1 Socioeconomic Features

71. This route is in East Nusa Tenggara Province. East Nusa Tenggara Province consists of 12 Kabupatens and Kot. Kupang. Proposed sites are located in Flores island of Kabupaten Flores Timur and in Alor island of Kabupaten Alor. The source for this section comes from "Dalam Angka 1990".

(1) Population

1) East Nusa Tenggara Province

72. The population in East Nusa Tenggara according to the Population Census in 1990 was 3,268,644 while the growth of population was 1.79% per year (during the period of 1980 - 1990). (See table 2-1-1A)

2) Kabupaten Flores Timur

73. The population in Kabupaten Flores Timur was 265,759 consisting of 116,222 men and 149,537 women with an average density rate of 86.3 people per km². The population growth was -0.52% per year during 1986-1990 and -2.73% during 1989-1990.

3) Kabupaten Alor

74. The population in Kabupaten Alor was 144,629 consisting of 70,335 men and 74,294 women with an average density of 50.5 people per km². The population growth was 5.93% per year from 1986-1990 and 4.09% in 1989-1990. The population in Alor island was 110,585 consisting of 54,140 men and 56,445 women with an average density of 52.41 people per km². The population growth was 1.23% per year during 1986-1990 and 3.72% during 1989-1990.

(2) Industry

1) East Nusa Tenggara Province

75. About 33.7% of the area is suitable for agriculture. Only 2.6% of the area is suitable for wet agriculture and the rest can be used for dry agriculture only. The main agricultural export commodities in East Nusa Tenggara such as coconut, coffee, chocolate, cotton and cashew nut contributed 80% to the export value of East Nusa Tenggara in 1990. It was the major source of income in the region and the source of state foreign exchange.

76. The potential of the fishery in East Nusa Tenggara is quite high, especially the sea fishery which covers 199,520 km². This area has the ability to produce 240,000 tons per year, but only 22.4% or about 53,765.8 tons of this potential have been cultivated.

77. East Nusa Tenggara has mineral deposits such as gold, silver, copper, manganese, lead and nickel. The quantity of the deposit is not known. There are other mining sources such as limestone, clay, kaolin, quartz sand, barite, sulfur, gypsum, phosphorous, and trass found in East Nusa Tenggara; however, the quantity of this deposit is also not known. Limestone and clay are used as the main materials in the cement industry.

(3) Gross Regional Domestic Product

1) East Nusa Tenggara Province

78. About 85% of the people of East Nusa Tenggara work in the agriculture sector. This sector has a very important role in the forming of the structure of GRDP of the East Nusa Tenggara. The contribution of this sector was 51.47% in 1990.

79. In East Nusa Tenggara Province, GRDP in 1989 based on the current prices was 1,040,253,991 thousand rupiah which meant that compared to 1983(498,306,972 thousand rupiah), it increased by 208.76%. The growth of GRDP in 1989 increased by 110.95% compared with that of 1988. Based on the constant 1983 prices, the productivity of 1989 increased by 133.83%. The

productivity of the years before compared with that of 1983 was 121.97% in 1987, 126.83% in 1988 and 133.83% in 1989. (See Table 2-3-1A)

80. Among the many indicators, there is one indicator to measure the level of prosperity of an area, namely, income per capita. The income per capita of the people of East Nusa Tenggara is still low compared with the average national income per capita. The income per capita of the people of East Nusa Tenggara reached Rp. 344,254 in 1990 (national income per capita was Rp. 844,174)

2) Kabupaten Flores Timur

81. Kabupaten Flores Timur's GRDP at current prices in 1989 was 70,552,782 thousand rupiah which meant that compared with 1983(37,463,678 thousand rupiah), it increased by 188.32%. The growth of GRDP of 1989 increased by 9.60% compared with that of 1988. In 1987, the growth of GRDP compared with 1983 was 155.89%, 171.83% in 1988 and 188.32% in 1989.

The rate of growth of GRDP in previous years was as follows: 9.60% in 1989 and 16.28% in 1988. (See Table 2-3-2A)

82. Realistically, the development of GRDP was based on the constant prices of Kabupaten. In 1989, based on the constant 1983 prices, it was 45,023,849 thousand rupiah. The productivity of 1989 increased by 120.18% compared with that of 1983. The productivity of the years before compared with that of 1983 was as follows: 110.69% in 1987, 115.64% in 1988 and 120.18% in 1989.

83. The growth of real economy (constant prices of 1983) in Kabupaten mentioned above cannot be separated from the growth in each sector. The economic activities in Kabupaten are varied but an dominated by the agriculture sector. In recent years, the rate of agriculture sector has been as follows: 1987 = 51.15%, 1988 = 51.18%, 1989 = 50.53%.

3) Kabupaten Alor

84. In Kabupaten, GRDP in 1989 based on the current prices was 52,091,176 thousand rupiah which meant that compared with 1983(29,192,233 thousand rupiah), it increased by 178.44%. The growth of GRDP in 1989 increased by 108.76% compared with that of 1988. In 1987, the growth of GRDP compared

with 1983 was 144.84%, 164.07% in 1988 and 178.44% in 1989. The rate of growth of GRDP in previous years was as follows: 8.76% in 1989 and 10.66% in 1988. (See table 2-3-3A)

85. Realistically, the development of GRDP was based on the constant prices of the GRDP in 1983 of Kabupaten Flores Timur. In 1989, based on the constant prices, it was 34,222,055 thousand rupiah and the productivity of 1989 increased by 117.23% compared with that of 1983. The productivity of the years before compared with that of 1983 was as follows: 108.22% in 1987, 112.44% in 1988 and 117.23% in 1989. The rate of development in the previous years in Kabupaten was 4.26% in 1989 and 3.91% in 1988.

The biggest contributor to GRDP is the agriculture sector. The percentage of the sector of agriculture was as follows: 1987 = 57.44%, 1988 = 57.11%, 1989 = 56.74%.

(4) Road Conditions and Number of Vehicles

86. The type and length of road in 1990 are as follows: state-road - 1,173.78 km, provincial road - 1,889.90 km, and kabupaten road - 11,845.71 km. Of the total road surface, 3,259.80 km or 21.96% is in good condition, 2,571.24 km or 17.32 % is moderate, 5,114.70 km or 34.45% is damaged and 3,899.71 km or 26.28% is heavily damaged. Concerning the road surface, 4,064.34 km or 27.38% is covered by asphalt, 3,552.01 km or 23.93% by gravel, 6,594.96 km or 44.42% by earth, and for 634.40 km or 4.27% no data exist. The use of asphalt increased steadily during 1986-1990 by an average of 31.48% / year. (See Table 2-3-4A)

87. Road length in Kabupaten Flores timur (1990) is 1,157.35 km. Compared with 1989 when road length was 978.50 km, it has increased by 18.28 %. Concerning the road condition, 187.60 km or 16.21 % is in good condition, 68.30 km or 5.90 % is in moderate condition and 901.45 km or 77.89 % is in damaged condition. In terms of road surface, 250.20 km or 21.62% is asphalted, 286.95 km or 24.79% is gravel and 620.20 km or 53.59% is earth. (See Table 2-3-5A)

88. Road length in Kabupaten Alor Timur (1990) is 849.10 km. Compared with 1989 when the road length was 903.30 km, it has decreased by 6.00 %. Concerning the roads condition, 70.40 km or 8.29 % is in good condition, 45.75

km or 5.39 % is in moderate condition, 144.05 km or 16.97 % is in damaged condition and 588.90 km or 69.36% is heavily damaged. In terms of road surface, 116.15 km or 13.68% is asphalted, 144.05 km or 16.97% is gravel and 588.90 km or 69.36% is earth. (See Table 2-3-6A)

89. There were 41,579 vehicles in this province in 1990, 1,216 passenger cars, 3,358 mini-buses, 6,560 trucks, 2,629 jeeps and 27,816 motorcycles. Compared with 1989 the number of vehicles has increased by 5.73% or from 39,325 in 1989 to 41,579 in 1990. In Kabupaten Flores Timur there were 984 vehicles. Motorcycles are the predominant type of vehicle (725 or 73.68%) followed by trucks (109 or 11.08%). There were only 17 passenger cars, 1.73% of the total vehicles. In Kabupaten Alor, there were 2,186 vehicles in 1990, 4 passenger cars, 87 mini-buses, 442 trucks, 60 jeeps and 1,593 motorcycles. Compared with 1989(2,276) the number of vehicles in 1990 has increased by 2.73%. (See table 2-3-7A to 2-3-9A)

2-3-2 Transportation Activities

(1) Air Transportation

90. Kupang, the capital city of East Nusa Tenggara(NTT) province, is the "Hub" of the pioneer air network services for the region. Kalabahi, main city of Alor Island, and Larantuka located in the east end of Flores Island, are connected only to Kupang by these pioneer air networks. There is no direct flight service between Kalabahi and Larantuka.

91. The frequency of the flight service between Kalabahi and Kupang is one round/day except on Saturday. Between Larantuka and Kupang there are fewer direct services, only two round trip services in a week. To gain access to Larantuka from Kupang there is another way, using the Kupang-Maumere route, on which nearly two round trip daily services are available. Maumere is located in the eastern part of Flores island and it is on the network of the main domestic air services. From Maumere it takes about 3.5 hours by car to reach Larantuka.

92. The capacity of the direct flight service is very limited, only for 20 persons. The capacities of the Kupang-Maumere route are for 44-60 persons.

93. According to the O-D survey conducted by MOC in 1988, the volume of passenger transported by airplane is as follows.

Kab.Kupang - Kab.Alor	3,393 persons/year
Kab.Kupang - Kab.Flores Timur	1,420 persons/year
Kab.Alor - Kab.Flores Timur	no direct flight

94. Based on Air Transport Statistics(1990), traffic volume handled at Kalabahi and Larantuka are as follows;

- Kalabahi -

Passenger	Departure	2,645	Cargo	Loaded	6,898 kg
	Arrival	2,625		Unloaded	14,722

All departure passengers went to Kupang.

- Larantuka -

Passenger	Departure	199	Cargo	Loaded	360 kg
	Arrival	341		Unloaded	3,082
	Transit	105			

All departure passengers went to Kupang.

(2) Sea Transportation

1) Ferry Transportation

95. Between Flores island and Alor island, there is no complete ferry service network; service is only conducted along short section between Larantuka, Waiwerang(Adonara island), and Lewoleba(Lomblen island). All of the ferry routes in the area concerned have been developed with Kupang serving as the base port. The ferry service of the route between Larantuka and lewoleba is operated as an extended part of the route from Kupang to Larantuka. There are six routes at present, which are shown in Fig. 2-3-1A.

96. Three boats have been operated for 5 routes. Two boats are 328 GRT(RT) size with the capacity of 200 passengers and 10 vehicles, and the other one is 223 GRT(RT) with the capacity of 100 passengers and 10 vehicles.

97. The ferry transportation volume(1990) and the characteristics of the 5 routes are presented in Table 1-3-3A. The frequency of the 5 routes are 2 rounds/week for Larantuka and Kalabahi routes, 4 rounds/week for Rote route, and 1 round/week for Sabu route.

98. As for the Kupang-Larantuka-Waiwerang-Lewoleba route, more detailed data on transportation volume are shown in Table 2-3-10A. From this Table, the "Loading Factors" of each O-D section can be calculated. The biggest transportation volume is seen in the O-D section from Larantuka to Kupang. In this O-D section the average transportation volume of the passenger is around 200 persons/trip (199 persons/trip(1991) and 207 persons/trip(1989)). The average transportation volume of 4-wheeled vehicles is calculated at 1.0/trip(1989) and 0.6/trip for 2-wheeled vehicles(1989).

99. Similarly, in the section between Larantuka and Waiwerang, the average transportation volume of the passenger are 17 passengers/trip(from Larantuka) and 42 passengers/trip(to Larantuka) in 1990. As for the section between Waiwerang and Lewoleba, they are calculated at six(from Waiwerang) and 11(to Waiwerang) in 1990. As for the section between Larantuka and Lewoleba, they are 28 and 52 in 1990. At any rate, the transportation volume are very low compared with the boat capacity.

100. The study team conducted "fill out questionnaire" type of survey for the passengers on the two routes, Kalabahi-Kupang and Larantuka-Kupang. 143 passengers answered to the questionnaire in total, in which 18 passengers were on Klabahi-Kupang route and 125 passengers on Larantuka-Kupang route. The results are as follows and also shown in Table 3-3-12A and Fig.3-3-2A. Concerning the passengers' occupation, "Students" were the largest in number, accounting for 32% followed by "Merchants" and "Businessmen" with the same proportion of 21% each. Regarding the purpose of trip, "Visiting Relatives" accounted for 46% as the top-ranked followed by "Business" with the proportion of 27%. Concerning the request to ferry service, the top-ranked request was for the improvement of "Capacity of Ferry Boat" accounting for 26% of the total requests. The second-ranked request was for the improvement of "Speed of Ferry Boat", with the proportion of 15% followed by the requests for improvement of "Tariff" and "Frequency of Service".

2) Conventional Sea Transportation

101. The networks of the conventional liner services which connect those islands are shown in the Fig. 2-3-1A. There are three liner boats in operation. Their required times of voyage are 21 days("Elang", 500DWT, PELNI), 23 days

("Baruna Fajar", 500DWT, PELNI), and 7 days("Diana Express", 20ton) for one round. They transport not only cargoes but also passengers.

102. Table 2-3-11A shows the passenger volume transported by PELNI's ships. The transportation volumes between Larantuka and Kalabahi are 112 persons/year(from Larantuka to Kalabahi) and 99 persons/year(from Kalabahi to Larantuka). They have a very small transportation volume.

103. Besides the liner services mentioned above there are other transportation services by small boat. Between Kalabahi and Baranusa in Pantar Island, there are some small boats operated by the people. It takes about 4 or 5 hours for the trip. Some of these boats offer 2 or 3 round trip services in a week, and transport about 50 passengers for each trip. The cargoes from Pantar island which the people bring to Kalabahi are corn, chickens, firewood, etc.

104. From Larantuka to Waiwerang in Adonara Island, and to Lewoleba in Lomblen Island, there are also small boats for daily service. Between Larantuka and Waiwerang, there are two small boats, each of which offers one round service daily. The passenger volume of each trip is about 50 or 60 persons. Between Larantuka and Lewoleba there are also two small boats for daily service.

105. By interviewing passengers going from Larantuka to Waiwerang, following information was gathered;

- * Among the 18 passengers who were going to Waiwerang 16 persons were on visiting family and 2 persons were on business.

- * Among the 32 passengers who were going back to Waiwerang, 14 persons were returning from visiting family/relative, 10 persons were on business, 4 persons were from school, one was from shopping, etc.

2-4 South East Sulawesi - West Kabaena Route

2-4-1 Socioeconomic Features

106. This route is in Southeast Sulawesi Province. South East Sulawesi Province consists of 4 Kabupatens and Kot. Kendari. Proposed sites are located in Kabupaten Buton.

The source for this section comes from "Dalam Angka 1990".

(1) Population

1) South East Sulawesi Province

107. According to the census in 1990, population in South East Sulawesi was 1,349,619. The population growth rate of South East Sulawesi during 1980-1990 was 3.94% per year, while during 1989-1990 it was 6.97%. Concerning Indonesian population growth rate during 1980-1990 it was about 2.15% per year. It meant that population growth rate of South East Sulawesi was still greater than that of Indonesia. This was caused by the large number of people who had settled here as part of the transmigration program. (See Table 2-1-1A)

108. The transmigration program was developed by the Government to balance population distribution in all provinces in Indonesia. Transmigration program aims at moving people from densely populated areas to other areas in Indonesia where the population is small.

Based on transmigration type in South East Sulawesi, there are general transmigration and spontaneous transmigration. They are being placed in four Kabupaten, they are Kabupaten Buton, Kabupaten Muna, Kabupaten Kendari, and Kabupaten Kolaka. Total number of transmigrants received by South East Sulawesi in 1989 were 201 household with 783 spontaneous transmigrants. Kabupaten Buton received eight household or 24 people, Kabupaten Muna received 26 household or 90 people, Kabupaten Kendari received 132 household or 576 people and Kabupaten Kolaka received 35 household or 93 people.

2) Kabupaten Buton

109. The population in Kabupaten Buton was 395,653, consisting of 191,894 men

and 203,759 women with an average density rate of 61 people per km². The population growth rate was 7.66% during 1986-1990 and 3.12% during 1989-1990.

(2) Industry

1) South East Sulawesi Province

110. The state-forest occupies 1,866,451ha or 48.94% of the total land area. Second is the un-using land of 455,033ha or 11.93%. Third is plantation - 357,126ha or 9.36% and fourth is for woody plants- 252,785ha or 6.63%.

111. Food production in this province consists of rice, rice from dry-plantation, corn, cassava, sweet potato, soybean, peanut and mung bean.

The highest production in 1989 was cassava with about 214,376 tons over an area of about 18,801ha. Cassava production comes from Buton - 109,611 tons over an area of 10,64 ha, Muna - 52,085 tons over an area of 3,652 ha, Kendari - 40,134 tons over an area of 3,489ha, and Kolaka - 12,548 tons over an area of 3,489 ha. Compared to 1988 the production in 1989 declined by 6.90% or about 230,257 tons. The production of rice followed with about 135,120 tons over an area of 40,377ha.

112. Plantation products in South East Sulawesi are coconut, coffee, cotton, pepper, nutmeg, clove, cashew fruit, tobacco, cacao, cotton, candlenut and sugar cane. Coconut, coffee, pepper, clove, cashew fruit and cacao have the potential to become export commodities. Coconut has the highest production volume. Coconut production is highest at Kendari with about 18,280 tons, second is Buton at about 5,489 tons, third is Muna at about 4,669 tons and fourth is Kolaka at about 4,624 tons. Cashew plantations covers the widest area about 97,914 ha that is in Buton about 32,041 ha, Muna about 40,391 ha, Kendari about 21,409 ha and Kolaka about 1,073 ha.

113. The catching fish activity in this province is done through the sea-fishery and land fishery (fish pond, pond, and public waters).

The fish production in 1989 was 91,619.6 tons with a value at about 61,268,833 thousand rupiah that are the sea-fishery - 85,046.6 tons (47,579,370 thousand rupiah) and land fishery - 6,573 tons (13,689,463 thousand rupiah).

2) Kabupaten Buton

114. Of the total land area(646,300ha), 30.63% is covered by national forest. Other land use includes plantations(15.13%), followed by lands for timber or woods 14.15%.

115. In 1990 the production of corn, cassavas, sweet potatoes, peanuts and soybeans increased from the year before. On the other hand, the production of rice and mung beans decreased. Rice production fell to 17,966 tons (in 1990) from 22,407 tons (in 1989) or by 19.82% and for mung beans production fell to 158 tons (in 1990) or by 59.90% from 394 tons (in 1989).

The decline in rice production is the result of smaller harvest area. The decline in mung beans was the result of pests and drought.

Corn production increased to 24,347 tons (in 1990) from 16,708 tons (in 1989) or by 45.72 %, cassava production increased to 154,909 tons (in 1990) from 128,618 tons (in 1989) or by 19.66 %. The reason for this increase in production is greater harvest area for these crops. The production of sweet potatoes showed the greatest increase.

Its production doubled to 10,045 tons (in 1990) or increased by 85.43% from 5,417 tons (in 1989).

116. In the fishery, production in 1990 increased to 50,658.2 tons (in 1990) from 31,574 tons (in 1989) or by 60.44%.

This is a result of increasing numbers of fishermen, modern equipment, and large number of fleets.

117. The forest area in Kabupaten Buton (1990) is estimated 590,808 ha or 91.41 % of land area in Kabupaten Buton.

From its functions, the forests can be classified to production forest 136,525 ha (23.11 %), limited production forest 145,880 ha (24.68%), protected forest 46,320 ha (7.84%), conversion production forest 200,750 ha (33.98%) and national park/PPA 61,333 ha (10.38%).

The forest industries is supported by hardwood trees (teak), timber and others forest crops such as rattan, firewood, bamboos etc.

(3) Gross Regional Domestic Product (GRDP)

1) Southeast Sulawesi Province

118. From the constant prices in 1983 we know that South East Sulawesi GRDP growth during 1983-1989 averaged 7.44%/year, that is, from 294,274.67 million rupiah in 1983 to 420,778.25 million rupiah in 1989.

This number is smaller than the target in Pelita IV which forecast growth at 7.5% per year. But it is larger than Indonesia's economic growth during the same period, which was 5.13%. The biggest contributor to GRDP was the agriculture sector at 42.55%. (See Table 2-4-1A)

119. The regional income per capita based on the current prices in 1984 was 320 thousand rupiah and in 1988 it became 450.7 thousand rupiah or increased by 8.9% per year. Based on the constant prices in 1983, it was 285.6 thousand rupiah and in 1988 became 324.9 thousand rupiah or increasing by an average of 3.28% per year.

The average increase in the regional income per capita (3.28%/year) is still lower than the population growth of South East Sulawesi during the same period, which was 3.45%.

2) Kabupaten Buton

120. In Kabupaten Buton, GRDP in 1989 based on the current prices was 145,125.25 million rupiah which meant that compared to 1983 (84,250.03 million rupiah) it increased by 172.26%.

The growth of GRDP in 1989 increased by 107.73% compared to that of 1983.

At constant prices GRDP in 1989 was 103,897.14 million rupiah which increased by 111.37% compared to that of 1983. (See Table 2-4-2A)

121. Based on current prices, the dominant sector is agriculture (41.01%), followed by government (23.83%) and trade (15.16%).

Based on constant prices in 1983, the order is the same as above. The dominant sector is agriculture (43.47%), government (22.25%), trade (14.66%).

122. One of the measuring rod used to determine the prosperity of a region is income per capita. In Kabupaten Buton, income per capita based on constant

prices in 1988 was Rp. 339,001.30 and increased by 5.09 % in 1989 to Rp. 356,257.60.

Income per capita in 1988 (based on constant price in 1983) was Rp. 249,992.94 and increased by 1.96 % in 1989 to Rp. 254,903.37.

(4) Road Conditions and Number of Vehicles

1) Southeast Sulawesi Province

123. Roads are the main means of land transportation in economic relations between cities and villages. Road conditions have a great basing on economic relation between city and village. Good road conditions promote economic and social activities between people in different areas. But bad road conditions present a serious obstacle to these types of relations. The type and length of road in 1989 are as follows: state-road - 336.55 km, provincial road - 1,028.06 km, and district road - 4,102.64 km. (See Tables 2-4-5A and 2-4-6A)

124. Of the total road network extending for 5,467.25km, 1,529.55km or 27.98% is in good condition, 1,492km or 27.29% is moderate, 1,004.98km or 18.38% is damaged, and for 1,440.48km or 26.35% there is no data. In terms of the road surface, 1,810.45km or 33.12% is asphalted, 1,485.32km or 27.17% is gravel, 1,206.89km or 22.07% is earth, and 964.59 or 17.64has no data.

The use of asphalt increased steadily during 1985-1989 at an average of 10.27% per year. In 1985, 1,110km of road was covered with asphalt, but by 1989 that figure had jumped to 1,810.45km.

2) Kabupaten Buton

125. Road length in Kabupaten Buton (1990) is 764.90km. Compared to 1989 when road length was 1,223.39km, it decreased by 37.38% in 1990 because road length in Kecamatan Poleang and Rumbia wasn't included.

In terms of the road condition, 271.00km or 35.43% is in good condition, 398.90km or 52.15% is in moderate condition, 39.00km or 5.10% is damaged condition and 56.00km or 7.30% is seriously damaged. (See Table 2-4-7A)

126. Land transportation is the most important means of transportation in this province. Passenger, agriculture production, forestry production and others all

depend on land transportation.

The number of vehicles in 1989 in this province is 25,780, composed of 4,222 cars, 839 mini-buses, 3,437 cargo-cars, and 17,282 motor-bicycles. The number of machine vehicles in 1989 compared to 1988 increased by 13.04% or from 22,805 in 1988 to 25,780 in 1989.

Of the total number of vehicles, in Kabupaten Buton, cars or mini bus account for 104, commodity cars account for 105 and motorcycles account for 3,624.

2-4-2 Transportation Activities

(1) Air Transportation

127. The capital city of Southeast Sulawesi Province, "Kendari", is connected to the other main cities in Indonesia by way of Ujung Pandang or Denpasar by domestic airline service. It is possible to go to Kendari everyday by way of Ujung Pandang from Jakarta. As for the connection of Kabaena island, Muna island and Wowonii island, however, there is no air transportation service. The only means to get there is to utilize cars and ships.

128. According to the O-D survey conducted by MOC in 1988, the volume of passenger transported by airplane is as follows.

Kot.Ujung Pandang - Kab.Kendari	15,560 persons/year
kot.Ujung Pandang - Kab.Muna	403 persons/year

129. Based on Air Transport Statistics(1990), traffic volume handled at Ujung Pandang are as follows;

Passenger Departure	279,146	Cargo Loaded	10,111,399 kg
Arrival	306,070	Unloaded	10,368,143
Transit	266,807		

About 6% of Departure or 15,556 Passengers went to Kendari. 83,812 passengers went to Jakarta and 61,331 went to Surabaya.

(2) Sea Transportation

130. The sea transportation of Kabaena with main island is mainly through Sikeli port(western coast). Ferry service, however, does not yet exist. Regarding the neighboring islands, Buton island and Muna island are connected with the

main island of Southeast Sulawesi Province with two ferry routes. This proposed ferry route is aimed to connect Kabaena island with the main island of Southeast Sulawesi Province.

131. Currently there are three main routes of sea transportation from main island to Sikeli Port, that is, Bupinang(about 40 km from Banbaea), Banbaea and Kasipute(about 35 km from Banbaea)(Fig. 2-4-1A). Proposed site of Banbaea is located along the highway between Bupinang and Kasipute. Banbaea coast is very gentle and the distance from the shore line to the point of water depth of -5m is approximately 550m. Sea transportation of passengers and commodities to Sikeli needs the help of small boats in the shallow water, which seems to limit the size and volume of cargoes. (The result of the field survey and interviews in Bambaena shows that littoral drift changes its direction seasonally and does not have a constant tendency. The road to Kolaka(the distance is about 110 km) is now under large-scale repairs and in a few years will be completely paved with asphalt.)

132. Sikeli Port of Kabaena island is surrounded by reefs and a small island and thus the area is very calm(Fig 2-4-2A). As shown in Fig. 2-4-1A, Sikeli Port has many sea transportation connections with the main island and Buton island. From each port and place, Ujung Pandang, Bone, Bupinang, Banbaea, Kasipute and Bau Bau, 20 - 50 ton class vessels come to Sikeli Port 2 or 3 times a week. According to interviews in Sikeli, unloading cargoes consist of foods (rice, vegetable, processing foods etc), machine parts and instruments and other commodities. Loading cargoes are cashew nut, coconut, palm sugar, fishes, timber and etc. There is no statistical data on loading and unloading cargoes in Sikeli Port, but based on the interviews, the volume of cargoes from Bone is the largest followed by those from Bau Bau and Bupinang. The mooring facilities of Sikeli Port is a wooden pier with 100m length and the water depth at the tip of the pier is about -6m.

(3) Others

133. The population of Sikeli is 2,040(1990), but if the two neighbor villages, Teomokole(the capital of Kecamatan Kabaena) and Baliara are included, this area has a population of 7,340 and represents the center of Kabaena island. Kabaena island consists of two kecamatans Kabaena and East Kabaena. There are two

high mountains(those heights are 1520m and 530m), and one unpaved road passes through the high land between the two mountains and connects villages of west coast and east coast(mini-bus transportation is connected twice a week from both sides). This road is planned to be asphalt-paved in 1992. In Langora, in the midway of this road, the transmigration of 500 families is planned in 1993 from Jawa island. The number of cars owned in Kecamatan Kabaena is 12 units. There is a market in the back of Sikeli Port, where many kinds of foods, clothes and other commodities are sold.

2-5 East Kabaena - Muna Route

2-5-1 Socioeconomic Features

134. This route is in Southeast Sulawesi Province. South East Sulawesi Province consists of 4 Kabupatens and Kot. Kendari. Proposed sites are located in Kabaena island and Muna island of Kabupaten Buton. The source for this section comes from "Dalam Angka 1990".

(1) Population

135. The population in Kabaena island was 26,451 in 1990. The area of the island was 938 km², and the average density rate was 28.20 people/km². The rate of population growth during 1987-1990 was 5.32% or 1.33% per year and 1.79% during 1989-1990. Muna island is divided into two Kabupaten. Mawasangka, proposed site in this study, is located in the south part of this island or in Kabupaten Buton. The population of Muna island, which belongs to Kabupaten Buton, was 57,858 in 1990 and it decreased by 1.23% compared to 1989(57,154). (See Table 2-1-1A)

(2) Industry

136. Industry in South Sulawesi Province and Kabupaten Buton has already been described in 2-4-1.

(3) Gross Regional Domestic Product

137. Gross Regional Domestic Product in South Sulawesi Province and Kabupaten Buton has already been described in 2-4-1.

(4) Road Conditions and Number of Vehicles

138. Length of road and number of vehicles in South Sulawesi Province and Kabupaten Buton has already been described in 2-4-1 and 2-4-2.

2-5-2 Transportation Activities

(1) Air Transportation

139. Air Transportation in Southeast Sulawesi Province has already been described in 2-4-2.

(2) Sea Transportation

140. In the east coast of Kabaena island, two jetties for mooring exist, one is at Dongkala(the capital of Kecamatan East Kabaena), the other is at Toli Toli. There are two islands, Damalawa Besar and Damalawa Kecil in front of Dongkala coast and the sea here is very calm. To the east of Toli Toli, there is a reef and here it is also very calm(Fig. 2-5-1A). The jetty of Dongkala has a length of 200m with a wooden pier, the water depth of which is about -1.5m, constructed by the local government.

141. The sea transportation of East Kabaena is mainly with Mawasangka, Bau Bau and Kasipute(Fig. 2-4-1A), the frequency of call is about twice a week from each place. Unloading cargoes in Dongkala and Toli Toli are various foods including rice and other commodities, and loading cargoes are palm sugar and rattan.

142. In the proposed terminal site at Mawasangka, on the west coast of Muna island, there is a jetty with 350m length constructed by local government, which is used mainly by fishing boats but is also used for sea transportation to the east coast of Kabaena island. The sea area in front of the jetty is covered by reef and is calm, and the boats access the jetty from southern area of the reef.

143. Mawasangka is connected with Bau Bau, the capital of Kabupaten Buton by road and ferry which is operated between Bau Bau and Torondona, and also with Raha, the capital of Kabupaten Muna by road, with Kendari by road and ferry which is operated between Torobulu and Tampo.

Time of Trip from	Kendari	to Torobulu	1:30
	Torobulu	Tampo	2:00
	Tampo	Raha	1:00

Raha	Mawasangka	2:30
Bau Bau	Tolandona	1:00
Tolandona	Mawasangka	1:30

2-6 Kendari - Wawonii Route

2-6-1 Socioeconomic Features

144. This route is in Southeast Sulawesi Province. South East Sulawesi Province consists of 4 Kabupatens and Kot. Kendari. Proposed sites are located in Kabupaten Kendari.

The source for this section comes from "Dalam Angka 1990".

(1) Population

1) Kabupaten Kendari

145. One of Indonesia's chief characteristics is its fast and high population growth rate. It also applied to South East Sulawesi, in this case in Kabupaten Kendari.

The population in Kabupaten Kendari in 1990 was 488,392. Compared to total population(423,442) in 1986, it increased by 15.34% or 3.07% per year. It shows that Kabupaten Kendari has a higher population growth rate than South East Sulawesi(1.34% per year). (See Table 2-1-1A)

146. Population distribution in Kabupaten Kendari is not spread evenly. As a result, population density varies. Kabupaten Kendari which has 16,480 km² of land is occupied by 488,392 people in 1990. That works out a population density rate of 30 people/km². It is less than the population density rate in South East Sulawesi, which is 35 people/km².

147. The population in Wawonii island was 21,051 with a density rate of 27.2 people/km². The population growth during 1986-1990 was 2.62% per year and 5.90% during 1989-1990.

148. The high population rate in Kabupaten Kendari is the result of the transmigration program, general or spontaneous. Also, Kendari is the capital of South East Sulawesi. So, Kendari is the central government for South East Sulawesi, central economic region, central trade region and education and culture center. It made the greatest contribution to urbanization and population mobility than other kabupaten in South East Sulawesi. Number of people who

transmigrated to Kabupaten Kendari from 1979 to 1989 is 20,184 households or 83,455 people, consisting of 14,487 households or 60,019 people in general transmigration and 5,697 households or 23,436 people in spontaneous transmigration. Most people(18,363) came from East Java.

(2) Industry

1) Kabupaten Kendari

149. In Kabupaten Kendari land area is 1,648,000 ha which consists of 33,959 ha (2.06%) of wet rice fields and 1,614,041 ha (97.94%) of dry land. Half of the land(49.06%) is national forest and un-using land of 135,842 ha (8.24%), grass fields and swamps 117,263 ha (7.12%). It is shown that most of the land has not being cultivated for agriculture and other interests.

150. In food crops production, rice production in 1989 is 68,389 tons. In 1990, it increased to 78,998 tons (15.51%), wet fields rice accounted for 68,111tons and dry fields rice 10,887tons. The main reason for the increase in rice production is the increase of the harvest area, from 23,160 ha in 1989 to 27,217 ha in 1990 (17.52%).

151. There is a variety of plantation commodities in this area, coconut, coffee, cloves, cacao, cashews, kapok, cotton, candlenut tree, pepper, nutmeg, ginger etc. Some mainstay commodities such as cacao, cashews, cloves, coconut, coffee and kapok in the last four years have increased their production. Cacao production recorded 71 tons in 1987 and increased to 2,383 tons in 1990 (839.08% per year). Kapok production in 1987 was 24 tons, and increased to 213 tons in 1990 (196.88% per year). Cloves production recorded in 1987 was 41 tons and in 1990 increased to 235 tons (118.29% per year).

152. The purpose of developing the fishery is to increase fish production to satisfy domestic consumption and also for export. Fish production in Kabupaten Kendari mainly comes from the sea. Fish production in 1990 totaled 22,739 tons with Rp. 13,691.1 million value. From that number, 21,112 tons (92.84%) came from sea and the rest 1,627 tons from land. It increased by 4.28% (in 1989 only 21,806 tons) and production value increased by 61.61%.

153. The forest area in Kabupaten Kendari is 1,220,625ha (1990). Concerning its function classifications, production forest is 663,326ha (54.34%), preserved forest is 151,575ha (12.42%), national park is 112,350 ha (9.20%) and converted production forest is 293,374ha (24.04%).

Logs production in 1990 have reached to 3,844 m³ which consist of 1,342 m³ teak woods and 2,502 m³ timbers. If compared to production in 1989, it increases by 34.88 %. In the same time, rattan production seems to decline to 1,234tons in 1990 from 2,576tons in 1989.

154. Industrial development in Kabupaten Kendari is small-scale industries and production is also on a small scale. Industry in Kabupaten Kendari includes food industries, clothing and leather industries, electronics and metal industries etc. In 1990, total number of industries in Kabupaten Kendari is 592 units employing 3,803 people.

(3) Gross Regional Domestic Product (GRDP)

1) Kabupaten Kendari

155. The growing number of GRDP based on current prices during 1983-1989 increased by mean 18.36% per year. That number is higher than that of South East Sulawesi (16.46%). At the same time, based on constant prices, it reaches 11.34% per year and is higher than South East Sulawesi (7.96%). (See Table 2-4-3A)

156. Concerning each economic sector role based on constant 1983 prices, the agriculture sector makes the biggest contribution to GRDP. Agriculture sector's share in 1986 was 34.78%, 35.45% in 1987, 36.74% in 1988 and 35.53% in 1989 respectively. Transportation and communication sector, people's services and trade follow agriculture in terms of GRDP contribution..

These four sectors form the potential base for the Kabupaten Kendari economy. The four sectors contribution to GRDP in 1986 was 86.60 %, 85.94% in 1987, 86.30% in 1988 and 86.09% in 1989.

157. With economic development rate by mean 11,34% per year, GRDP per capita based on constant prices increased to Rp.386,800 in 1989 from Rp. 253,700 in 1983 or 7.28% per year. It is higher than the population rate with

3.73% during the same period. In 1983, regional income per capita based on constant prices increased to Rp. 360,600 in 1989 from Rp. 237,200 or 7.23% per year. It is higher than regional income per capita of South East Sulawesi which was 4.27% per year. Regional income per capita based on current price also increased, to Rp. 530,300 in 1989 from Rp. 237,200 in 1983 or by 13.99% per year. It is higher than regional income per capita rate in South East Sulawesi which was 12.25% per year.

(4) Road Conditions and Number of Vehicles

158. Roads can play a major role in the economic development of a region. In 1989, road length in Kabupaten Kendari was 1,091.4 km. Concerning its surface, 218.4 km (20.01%) is asphalted road, 376.6 km (34.51%) is gravel road, 199.4 km (18.27%) is earth road and 297.0 km (27.21%) is not specified. In terms of its conditions, 218.4 km (20.01%) is in good condition, 376.6 km (34.51%) is in moderate condition, 199.4 km (18.27%) is damaged and 297.0 km (27.21%) is seriously damaged. (See Table 2-4-8A)

159. There were 25,780 vehicles in this province in 1989: 4,222 cars, 839 mini-buses, 3,437 cargo-cars, and 17,282 motorcycles. Compared to 1988(22,805), the number of vehicles has increased by 13.04%(25,780). (See Table 2-4-10A)

2-6-2 Transportation Activities

(1) Air Transportation

160. Based on Air Transport Statistics(1990), traffic volume handled at Kendari is as follows;

Passenger	Departure	26,702	Cargo Loaded	118,603kg
	Arrival	24,896	Unloaded	535,204
	Transit	634		

Most of departure passenger went to Ujung Pandang. About 60% of arrival or 15,556 passengers came from Ujung Pandang.

(2) Sea transportation

161. Kendari Port is located at north coast of Kendari Bay(Fig. 2-6-1A), at the mouth of which there is an island and the width of the bay entrance is very narrow, which makes navigation difficult and there are many navigation aids. There are two wharves in Kendari Port, one, for general cargo, the other, for passenger. The total volume of loading and unloading cargoes in 1991 is about 240,000 ton, an increase of 13.7% over 1990. The number of passengers is about 169,000 persons in 1991 which is nearly equal to the number in 1990. The origin and destination of passengers is mainly Raha or Bau Bau. Four passenger ships are being operated on this route and each of two ships leave Kendari and Bau Bau in the evening, and calling at Raha Port at night, arrive at the other ports on the next morning.

162. In Kendari port, ferry service has not yet begun operations. As shown in Table 2-6-1A, two ferry routes connect Muna island(Raha is the largest city in this island) and Buton island(Bau Bau is the largest city in this island) with the main island of Southeast Sulawesi Province(capital of which is Kendari). Table 2-6-2A shows the number of passengers and vehicles, and the volume of cargoes from Torobulu(main island side) to Tambo(Muna island side). With the assumption that ferry service will be uninterrupted , the load factors of passenger and vehicle are estimated at 46% and 52% respectively (the capacities of ferry boat are 120 persons and seven units of vehicle).

163. Passengers and cargoes between Kendari city and Wowonii island are transported by five boats(approximately 20 GRT). The number of passengers per day is about 80(one way), almost all of whom are from Wowonii island, that is, boats start from Wowonii island early in the morning and return to Wowonii in the evening. For the mooring facilities, the jetty shown in Fig 2-6-1A is used, which is administrated by DGSC. The water depth is about 0.0 m and when the water level is low, small boats are needed to carry passengers and cargoes to the depot boats. Interviewing in Kendari shows that 50% of the passengers are on business matters and the other 50% are on private matters, and at the end and the beginning of week, the number of passengers increases because many students attend high schools and universities in the main island.

Cargoes from Wowonii to Kendari are:

cacao,coffee,woods,rattan,fish(which are exported from Kendari Port)

coconut(which is transported to Surabaya Port)
chicken(which is consumed in Kendari)
etc.

164. For transportation mode used by the passengers from Wowonii in Kendari city, 90% use a mini-bus(capacity is approximately 10 persons) and 10% travel on-foot, almost all of the latter are destined for the central market behind the jetty. There are two roads to the center of the city, one passes in front of the central market and the other is in the back.

At the halfway point on the road between the central market and the center of Kendari city, traffic volume was surveyed(21st of February,1992 10:00-11:00):

total traffic volume of vehicles(4 wheels)	440 units/hour/one-way
mini-bus	250 units/hour/one-way

This shows good accessibility for passengers.

165. Using the same jetty , about two small boats transport cargoes and passengers to Lasolo which is located northward from Kendari city. Also very small boats frequently transport passengers to the other side of Kendari Bay.

166. Langara coast, a candidate ferry terminal site, is surrounded by reef(Fig 2-6-2A) and is very calm, and has a 30m long wooden pier used for the transportation between Kendari city and also by fishing boats. According to the interviews at Kanwil of Southeast Sulawesi, there are approximately 50 days during the year when transportation is interrupted by waves and/or tidal current.

167. In Wowonii island, a loop road with the length of 142 km is under construction, of which 42 km of the road is scheduled to be completed in 1992/93 from Langara to Ladiana(located in northeast part of the island).

**2-6-3 The Result of the Interview Survey on Passengers of
Tampo-Torobulo Ferry Route(12th of February, 1992)**

(1) Origin and Destination

(Origin)	(Destination)		
	Tampo	Raha	Bau Bau
Kendari	2	3	1
Torobulu	10	3	
Ujung Pandang		1	

There might be some misunderstandings in the answers regarding
Torobulu-Tampo due to the inadequate interview format.

(2) Trip Purpose

home/relatives	10 person	to work	5 persons
business	1 person	others	2 persons

2-7 Morotai - Halmahera Route

2-7-1 Socioeconomic Features

168. This route is in Maluku Province. Maluku Province consists of 4 Kabupatens and Kot. Ambon. Proposed sites are located in Morotai island and Halmahera island in Kabupaten Maluku Utara.

The source for this section comes from "Dalam Angka 1990".

(1) Population

1) Kabupaten Maluku Utara

169. The population in Kabupaten Maluku Utara was 561,354, consisting of 287,809 men and 293,545 women. The population growth during 1986 - 1990 was 12.96% or an average of 2.59% per year and the growth rate during 1989-1990 was 6.51%. (See table 2-1-1A)

170. The strategic location for the central marketing of the production and distribution is Ternate. The relating location between Ternate and its hinterland is Tobelo, Kao, Bobonego, Buli, Weda in Halmahera island, Obi island, Bacan island, Tidore island and Daruba in Morotai island.

171. The population in Morotai island was 44,328 people consisting of 22,919 men and 21,409 women and the density rate average was 17.9 people per Km². The population in Daruba which is the main town in Morotai island was 26,639 in 1990 and 25,719 people in 1987, which represents an increase of 0.89% per year.

(2) Industry

1) Kabupaten Maluku Utara

172. The rice harvest area at Maluku Utara in 1990 is 36,079.9 ha and yields a production of about 80,164.96 tons. Wet rice-fields comprise 52.8 ha and account for 184.8 tons and the dry rice-fields comprise 36,027.1 ha and account for a production of 79,980.16 tons.

Compared with 1989, there is an increase of 177.89% in the area of the rice-field; this made possible the increase in production of 168.99%. Similarly, that of the dry-field rice was increased by 124.98%, resulting in increased production of 288.25%.

In 1990, the dry-field rice commodity has the largest harvest area at 36,027.1 ha and is able to produce 79,980.16 tons or 2.22 tons/ha.

173. The area of plantations has been increasing steadily for years. In 1990 the coconut plantation area occupied 74.99% (23,863 ha) of the total area of the plantation plant and the production of coconut in 1990 was 87,703 tons (91.78%).

174. Kabupaten Maluku Utara has sufficient sea resources such as fish and the other kinds of marine life. The catch increases each year. The production of tuna fish ranks first with 7,374.3 tons. In 1986 the fresh water fish and shrimp production reached 2.2 tons, then in 1990 totaled 32.87 tons, an increase of 1,394.09 %.

Regarding forestry in 1990, total production of the logs was 680,473.41 m³, most of which(55.02%) derived from Meranti wood.

(3) Gross Regional Domestic Product (GRDP)

1) Kabupaten Maluku Utara

175. In 1989, the GRDP of the Kabupaten Maluku Utara based on the current prices was 353,815,694 thousand rupiah. Compared with 1983(130,341,025 thousand rupiah), it increased by 171.45 %.

The GRDP development based on the prices above was shown too fast. It is not just as the result of the productivity development but it is also caused by the influence of the good price and service that increased every year. (See Table 2-1-4A)

176. In 1989, GRDP of the Kabupaten Maluku Utara based on the constant 1983 prices reached 210,977,515 thousand rupiah. It meant that the real productivity growth rate in 1989 reached 61.87%.

The rate of GRDP compared to 1983 was 26.41% in 1986, 51.48% in 1987, 53.37% in 1988 and 61.87% in 1989.

The rate of growth of GRDP in the previous years was as follows: 9.02% in

1984, 2.06% in 1985, 13.61% in 1986, 19.84% in 1987, 1.24% in 1988 and 5.54% in 1989.

The biggest contribution to GRDP is made by agriculture sector which accounted for 44.07% in 1989, 45.23% in 1988, 47.20% in 1987 and 49.05% in 1986.

177. One indicator to measure the society welfare of a country or region is the regional income per capita. Maluku Utara in 1983 had a regional income per capita based on the occupied price of 273,875 rupiah. In 1989, the regional income per capita of Maluku Utara increased substantially 622,945 rupiah or by 127.46% compared to 1983.

178. In the regional income based on the constant 1983 prices, it increased by 8.89% in 1984, 4.62% in 1985, 14.31% in 1986, 33.05% in 1987, 32.30% in 1988, 35.27% in 1989. It will be seen that the regional income of Maluku Utara increased from 364,398 rupiah in 1987 to 362,348 rupiah in 1988.

(4) Road Conditions and Number of Vehicles

179. Roads can promote the economic development of region by facilitating distribution between central areas and more remote ones.

180. In 1989 the length of the road at the Kabupaten Maluku Utara is 507.80 km. Concerning the road surface, 237.93km or 46.88% is asphalt-road, 207.07km or 40.80% is gravel road, 62.50 km or 12.32% is unspecified. The road condition in the same year indicates that 3.26% is in good condition, 71.22% is in moderate condition, 8.77% is in damaged condition and 16.75% is heavily damaged condition. (See Table 2-1-8A)

181. The number of vehicles in Maluku Province has already been described in 2-1-1.

2-7-2 Transportation Activities

(1) Air Transportation

182. Air transportation service in the study area is operated by PT. MERPATI AIRLINES. The networks are between Ternate (Ternate Island), Daruba (Morotai

Island) and Galela(Halmahera Island), which are shown in Fig. 2-7-1A.

183. The frequency of the service is 3 rounds in a week between Ternate - Galela and 1 round in a week between Daruba - Galela - Ternate. The capacity of the flight is very limited, only for the use of 24 persons.

184. According to the O-D survey conducted by MOC in 1988, the volume of passenger transported by airplane in area of Kab.Maluku Utara is 8,451 persons per year.

185. Based on Air Transport Statistics(1990), traffic volume handled at Ternate are as follows;

Passenger	Departure	25,718	Cargo Loaded	81,131 kg
	Arrival	24,027	Unloaded	272,347
	Transit	2,952		

Half of departure passengers went to Manado, 6,395 passengers went to Ambon and 1,984 went to Galela. About 60% of arrival passengers came from Manado.

(2) Sea Transportation

186. In Fig. 2-7-1A, sea transportation service networks are shown. It can be understood that Ternate is the center of the sea transportation service in the study area.

187. Between Morotai Island and Halmahera Island there is a liner passenger service, of which Ternate is also the base terminal. The network connects Ternate, Daruba in Morotai Island, and Tobelo in the northern part of Halmahera Island.

188. The distance between Daruba and Tobelo is 25 miles, taking about 3 hours. The distance between Daruba and Ternate is 145 miles, taking about 12 hours.

189. The PT. KARBALA RAYA LINE operates one passenger boat("Garuda",) with a capacity of 200 passengers. The boat offers 2 rounds service in a week.

190. The transportation volumes of the "Garuda" are shown in Table 2-7-1A. The Table shows the O-D data of the passenger's volume from each of the

three towns(terminals). The annual volumes of the boarding passengers are 12,176 (from Daruba), 14,049 (from Tobelo) and 10,462 (from Ternate) in 1991.

191. Based on interviews with passengers at both Tobelo and Ternate terminal, nearly all of the passengers were returning home, which possibly means that the purpose of their visit was Selling, Shopping or Visiting Relatives, etc.

192. Between Ternate Island and Halmahera Island there are many network services operated by small boats of the local people. Sidangoli is located in the nearest proximity to Ternate Island and it has the largest transportation between Ternate. (See the Table 2-7-2A)

2-8 South Sulawesi - Southeast Sulawesi

2-8-1 Socioeconomic Features

193. This route is in South Sulawesi and South East Sulawesi Province. South Sulawesi consists of 21 Kabupatens and Kot. Ujung Pandang. Proposed sites are located at Bajoe in Kabupaten Bone of South Sulawesi Province and at Kolaka in Kabupaten Kolaka of South East Sulawesi Province.

The source for this section comes from "Dalam Angka 1990".

(1) Population

1) South Sulawesi Province

194. The population in South Sulawesi Province was 6,980,589, consisting of 3,409,989 men and 3,570,600 women with an average density rate of 111.72 people per km². The population growth rate during 1986-1990 was 1.34 % per year. (See Table 2-1-1A)

2) Kabupaten Bone

195. The population in Kabupaten Bone in 1989 was 649,065, consisting of 305,234 men and 343,831 women with an average density rate of 142.37 people per km². The rate of population growth during 1986-1989 was 0.36% per year and during 1988-1989 was 0.06%. But it decreased by 5.97% to 610,315 in 1990.

3) Kabupaten Kolaka

196. From 1986 to 1990, there was an increase in population in Kabupaten Kolaka. In 1986, total population was 197,084. It increased to 239,682 in 1990, consisting of 123,997 men and 115,681 women.

The population growth rate during 1986-1990 averaged 21.61% or 4.32% per year and 9.08% per year in 1989-1990.

(2) Industry

197. In the food plants sector, rice is the main commodity and second is

maize.

The volume of rice harvested in South Sulawesi Province was 3,132,378 tons over 735,831 ha or 42.57 tons/ha. Kabupaten Bone harvested the most rice with 420,796 tons or 13.43%. Concerning maize, the largest producer was Kabupaten Buton with 169,126 tons or 37.38%.

In the plantation, production volume are as follows: coconut 269,966 tons, coffee 101,908 tons, cocoa 89,966 tons and candlenut 56,837 tons. All productions increased compared to the previous year.

Production by fishery sector is 318,269 tons in 1990 and Kabupaten Bone is ranked first (40,093 tons or 12.60%).

(3) Gross Regional Domestic Product (GRDP)

1) South Sulawesi Province

198. In South Sulawesi Province GRDP in 1989 based on the current prices was 3,735,668.12 million rupiah which meant that compared to 1983 (1,751,729.24 million rupiah) it increased by 213.26%.

The growth of GRDP in 1989 increased by 113.77% compared to that of 1988.

In 1987, the growth of GRDP compared to 1983 was 163.86%, 188.34% in 1988 and 213.26% in 1989.

The growth rate of GRDP in previous years was as follows: 113.77% in 1989 and 114.94% in 1988. (See Table 2-8-1A)

199. At the constant prices, GRDP in 1989 which was 2,502,520.39 million rupiah increased by 142.86% compared to that of 1983. The productivity of the years before compared to that of 1983 was as follows : 123.70% in 1987, 134.91% in 1988 and 142.86% in 1989.

The biggest contributor to GRDP is the agriculture sector. The share of the agriculture sector was 43.81%.

200. The real regional income per capita, excluding any effect of the increasing price shown by the counting of the regional income per capita based on the constant 1983 prices, increased. It was Rp. 289,165 in 1987 and Rp. 324,571 in 1989, an increase of 12.24%.

2) Kabupaten Bone

201. Based on the constant 1983 prices, the regional income per capita of Kabupaten Bone in 1986 was 193,898 million Rp., 197,771 million Rp. in 1987 and 210,183 million Rp. in 1988. The rate of growth compared to previous years was 6.28% in 1988 and 2.00% in 1987. (See Table 2-8-3A)

3) Kabupaten Kolaka

202. Based on the constant 1983 prices, the regional income per capita of Kabupaten Kolaka in 1986 was 369,045.01 million Rp., 349,448.32 million Rp. in 1987, 422,474.80 in 1988 and 492,500.27 million Rp. in 1989. The rate of growth compared to previous years was 16.57% in 1989, 20.90% in 1988 and in -5.31% 1987. (See Table 2-4-4A)

(4) Road Conditions and number of Vehicles

203. Land transportation in this province is very important as it is used to transport people, agriculture products, plantation products, forestry products etc. South Sulawesi province has three types of road, state-road - 921 km, provincial road - 1,690 km, and district road - 19,913 km.

Concerning road condition, from the total road network of 22,524 km, 7,237 km or 32.13% is in good condition, 5,832 km or 25.89 % is moderate, 5,159 km or 22.90% is damaged. Concerning road surface, 6,982 km or 31.00% is asphalted especially 96.78% is asphalted in state and provincial roads, 5,862 km or 26.03% is gravel. (See Table 2-8-3A)

204. Road length in Kabupaten Bone (1990) is 2,199 km. In terms of the road condition, 354 km or 16.10 % is in good condition, 663 km or 30.15 % is in moderate condition, 307 km or 13.96 % is bad condition and 875 km or 39.79 % is seriously damaged. In terms of its surface, 371 km (16.871%) is asphalted road, 626 km (28.47%) is gravels, 1,202 km (54.66%) is earth. (See Table 2-8-4A)

205. In Kabupaten Kolaka road, length is 3,693.66 km, the percentage of asphalt road is 19.21% or 709.7 km. The length of asphalt road in 1989 is 227.7 km, and increased to 482 km(211.68%) in 1990. (See Table 2-4-9A)

206. The number of vehicles in 1990 in this province is 304,05; 26,528 are passenger cars, 6,225 mini-buses, 37,476 trucks, and 233,823 motorcycles. The number of vehicles in 1990 compared to 1989(315,303) decreased by 3.57%. In Kabupaten Kolaka the number of vehicles in 1990 is 2,677, 274 buses, 201 cargo-cars, 141 trucks and 2,677 motorcycles.(See Table 2-8-5A)

2-8-2 Transportation Activities

(1) Air Transportation

207. The capital city of South Sulawesi Province, "Ujung Pandang", is connected directly or indirectly to the other main cities in Indonesia by domestic airline service. There are three direct daily flight services from Jakarta. As for the connection to Bajoe, there is no flight service and it takes 4 hours to Bajoe from Ujung Pandang by car.

208. According to the O-D survey conducted by MOC in 1988, the volume of passenger transported by airplane between Kot.Ujung Pandang and Kab.Kolaka is 897 persons/year.

(2) Sea Transportation

209. There is an existing ferry route between Bajoe and Kolaka with a distance of 80 miles. This ferry route is the so-called short-cut type, crossing Bone Bay. Northern part of Southeast Sulawesi Province is mountainous and land transportation between southern part of Southeast Sulawesi(Kolaka, Kendari and etc.) and Central Sulawesi appears not to be sufficient. Even if the road is perfectly paved and well maintained, the short-cut effect by this ferry route is large and the ferry transportation demand will continue to be high or to increase with the development of the related regions.

210. The present ferry operation is as follows:

- number of ferry boats; 5 vessels
- number of trips daily; 5(night trip)
- time of trip; 8 hours

211. Table 2-8-6A shows the monthly data of this ferry route. The average

number of passengers per one trip is 240-290 persons and the load factor is about 50-60%, the number of vehicles is 13 units, the volume of cargoes is about 100 tons. The share of trucks in the vehicles transported by ferry is estimated to be high, judging from the number of vehicles and the amount of cargoes transported by one trip. Table 2-8-6A shows traffic volume data for a recent four-year period. In proportion to the increased number of trips, 360 in 1989, to trips 572 in 1990, the volume of cargoes and the number of vehicles have increased, but the number of passengers has not sufficiently increased, which shows the high potential of cargo transportation demand.

212. The ferry cargo O-D survey by MOC shows:

- (1) 57% of ferry cargoes from Kolaka to Bajoe originate in Kabupaten Kendari,
- (2) 29%, in Kabupaten Kolaka,
- (3) 14%, in Kabupaten Buton.

Almost all of the above-mentioned cargoes are finally destined to Ujung Pandang.

213. The ferry passenger O-D survey by MOC shows:

DESTINATION	ORIGIN			Total
	Kolaka	Kendari	Others	
Watapone	20%	5%	0%	25%
Uj.Pandang	20%	13%	1%	34%
Others	23%	15%	3%	41%
Total	63%	33%	4%	100%

Compared to the cargo data, the share of Kolaka increases greatly, but destination of passenger spreads widely.

214. In the present ferry operation, two ferry boats start at night from each side of Kolaka and Bajoe, and reach Bajoe and Kolaka the next morning, the trip time is approximately eight hours; even if the trip number of ferry is somewhat increased, the ferry operation will continue to be conducted at night trip. It is necessary to study the possibility of improving efficiency at the present berth or to construct another ferry berth to meet the increasing demand. And also in Kolaka Ferry Port, plans for a new terminal are being studied by DGLT;

necessary land area will be obtained through reclamation of the coast.

215. In Bajoe Ferry Port, water depth is very shallow and the sedimentation occurs at a rate of 4cm each year. The minimum water depth around the tip of jetty is now about 3.5 m, while the draft of the largest ferry in this route is 4.0 m; therefore, dredging this area is urgent. The parking lot has an area of 2500 m², which is nearly equivalent to the capacity of vehicles loaded in one ferry boat. The enlargement of the parking lot is required especially if the number of nightly trip increases.

216. Fig. 2-8-7A shows the data on cargoes and passengers etc. in Kolaka Sea Port.

217. Referring to the interview survey, it has been suggested that ferry service should play an important role in development projects such as irrigation project, for which some improvements are required on ship side and loading/unloading facilities. When passengers and vehicles are loaded/unloaded together, access road on the jetty is very crowded and requires some improvements as proposed earlier.

2-8-3 The Results of the Interview Survey on Passenger of Ferry Boat (22nd(Saturday) of February, 1992, from Kolaka to Bajoe)

(1). The opinions and requests of drivers

- i) The road condition to Bajoe port is damaged 2 persons
- ii) The improvement of ferry boat to smooth
embarking/disembarking heavy equipment
through the ramp for the irrigation project
in Southeast Sulawesi 1 person

(2). The opinions and requests of passengers

- i) Passengers and vehicles must be separated during
embarking/disembarking 1 person
- ii) An increase of transportation services from
the port to Bajoe terminal 2 persons
- iii) The improvement of facilities and services of
ferry boat(water supply,lavatory,TV,air-conditioner,

baggage storage)

7 persons

(for example, increase of water supply capacity for the passengers who want to prepare praying)

(3). Origin and Destination

Origin	Destination		
	Ujung Pandang	Watampone	Others
Kolaka	24	7	7
Kendari	1	0	3
Others	2	0	0

(4). Frequency of passenger use on this ferry route

twice a week	1 person
once a week	7 persons
twice a month	3 persons
once a month	5 persons
twice a year	11 persons
once a year	7 persons

(5). Trip Purpose

home/relatives	28 persons	school	4 persons
work	6 persons	private	2 persons
business	7 persons	others	2 persons
		(sight seeing)	

(6). Access Means to Ferry Terminal

by bus	26 persons	by taxi	10 persons
on foot	3 persons	by automobile	3 persons
by truck(driver)	7 persons	(driver)	
by motorcycle	3 persons		

2-9 South Sumatra - Bangka - Belitung Route

2-9-1 Socioeconomic Features

218. This route is in South Sumatra Province. South Sumatra Province consists of 8 Kabupatens and Kot. Palembang. Proposed sites are located in kot. Palembang, Bangka island of kabupaten Bangka and Belitung island of Kabupaten Belitung respectively.

The source for this section comes from "Dalam Angka 1990".

(1) Population

1) South Sumatra Province

219. In 1986, the population in South Sumatra amounted to 5,672-thousand people, and in 1990 population reached 6,277-thousand people, an increase of 10.67% between 1980 and 1990, the average annual population growth of this province was 2.13%. (See Table 2-1-1A)

2) Kotamadya Palembang

220. According to the Census of 1990, total population in Kotamadya Palembang was 1,144,279 people. In 1986, the population was only 849,412 people and the growth rate was 6.93% per year. The population growth rate in Kotamadya Palembang during 1989 - 1990 was 20.60%. The area was 353.80 km², so the average density rate was 3,234.3 people per km².

221. Number of people who lived in the city was 1,081,354 people or 94.76 %, this kind of population distribution can cause social/economic problems for the government. For example, there were city development problems such as slums, very close houses, bad water supply, wild housing etc.

3) Kabupaten Bangka

222. The population in Kabupaten Bangka was 487,196 people consisting of 244,745 men and 242,451 women and an average density rate of 42.4 people per km². The population growth during 1986-1990 was 2.31% per year and during 1989-1990 was 6.42%.

223. The population in Bangka island was 601,304 people, consisting of 301,330 men and 299,974 women and an average density rate of 51.87 people per km². The population growth during 1986-1990 was 2.07% per year and during 1989-1990 was 5.32%.

4) Kabupaten Belitung

224. The population in Kabupaten Belitung was 188,996 people, consisting of 96,553 men and 92,443 women and an average density rate 41.56 people per km². The population growth during 1986-1990 was 1.09% per year and during 1989-1990 was 0.90%.

(2) Industry

1) South Sumatra Province

225. The priority of both national and regional development is still focused in the agriculture sector. Production of this sector supports other sectors such as industry, trade. The percentage of the population employed in agriculture sector ranks first among the sectors. In food crops production, sawah paddy increased to 1,145,831 tons in 1989 from 1,110,557 tons in 1988. The grand total for the harvested area of paddy was almost the same as in 1989. The harvest area for the dry-field paddy increased by 0.63 % and sawah paddy decreased by 0.54%.

226. Forestry production in 1989 increased. The sawn plywood increased to 229,378 in 1989 from 217,783 m³ in 1988, wood sawn increased by 4.64% to 770,281 m³ in 1989 from 736,137 m³ in 1988 and other production also increased. The fishery in South Sumatra produced 130,898.2 ton in 1989 or increased by 2.69%.

227. In the industry sector growth during 1983-1987 based on the constant 1983 prices registered 12.4%. The vital and strategic mineral material in South Sumatra is oil and natural gas, tin and coal. The mining and excavating sector in the South Sumatra is very dominant. The production of white-tin increased by 4.64% during 1988-1989.

2) Kotamadya Palembang

228. In Kotamadya Palembang, agriculture had only small role as Palembang is not an agricultural region. Part of Palembang contains swampy areas that cannot be developed into agriculture land and dominant agriculture was second business. In the harvest of rice, vegetables and fruits in 1990, it increased by 10.36% compared to 1989 or to 7,178.39ha from 6,504ha. For its production, it increased to 18.34% or to 27,391.26 tons from 23,146.36 tons.

229. Total fish production has greatly increased by 133.32% or to 7,630.70 tons in 1990 from 3,270.2 tons in 1989. Its value increased by 160.47%.

230. Industry, in Indonesia in general and especially in Kotamadya Palembang economy, is an important sector and makes the biggest contribution to GRDP. In 1989, the growth rate was 8.09% with oil and gas and 3.4% excluding oil and gas. It was calculated based on constant 1983 prices. Its contribution to GRDP in 1989 was 46.03% with oil and gas and 34.77% excluding oil and gas.

3) Kabupaten Bangka

231. In this area, main production was in the sector of industry and trade. At constant 1983 prices, trade(30.83%), followed by industry (28.82%) and mining(19.69%) made the biggest contributions to GRDP in 1989. The production in mining was white tin(20,927.5 tons), quart sand(12,140 tons) and kaolin(14,140 tons). In food crops production, sawah paddy was only 469 tons or 0.04% in this province.

4) Kabupaten Belitung

232. At constant 1983 prices, the biggest contribution was trade(24.85%) and followed agriculture(17.73%), industry(14.43%) and mining(19.69%). The production in mining was white tin(4,957.4 tons), quart sand(223,479 tons) and kaolin(264,941 tons).

(3) Gross Regional Domestic Product (GRDP)

1) South Sumatra Province

233. The South Sumatra's GRDP in 1989 reached 6,775,448 thousand rupiah, an increase of 744,817 thousand rupiah or 12.35% compared to 1988. (See Table 2-9-1A, 2-9-2A)

234. The GRDP based on current prices mentioned above is still affected by the inflation rate which occurred each year, so it does not give real economic growth for the period. Therefore the economic growth of South Sumatra is provided by GRDP based on the constant 1983 prices. The South Sumatra's GRDP has increased continuously and has reached 4,627,873 thousand rupiah, an increase of 6.89% during the period of 1988-1989.

235. Oil has been a big part of their output and is transferred to the central government. To obtain the GRDP which directly affecting the South Sumatra's economy, then the oil and gas are excluded. The serial data without oil, the South Sumatra's GRDP has increase. The average growth of the GRDP without oil during the period of 1983 to 1989(=3,295,968 thousand rupiah) was 4.81%. Agriculture, mining and quarrying, manufacturing industries and trade make big contributions to South Sumatra's GRDP. Collectively these four sectors accounted for 84.28% of the GRDP.

236. The per capita GRDP of South Sumatra in 1989 reached 1,262,802 rupiah, an increase of 21.77% compared to 1988. The South Sumatra's GRDP per capita has increased continuously by an average of 10.46% including oil and gas and by 9.01% excluding oil and gas.

2) Kabupaten Bangka

237. In Kabupaten Bangka, GRDP, including tin in 1989 based on the current prices, was 727,890 million rupiah which meant that compared to 1983 (330,888 million rupiah) it increased by 119.98% or 17.14% per year. The growth of GRDP in 1989 increased by 18.08% compared to that of 1988. GRDP excluding tin in 1989 based on the current prices was 349,237 million rupiah which meant that compared to 1983(86,063 million rupiah) it increased by 305.79% or

43.68% per year. The growth of GRDP in 1989 increased by 9.35% compared to that of 1988. (See table 2-9-3A, 2-9-4A)

238. In 1989 based on the constant prices of GRDP 1983, the productivity of 1989 (412,370 million rupiah) increased to 124.63% compared to that of 1983. The productivity of the years before compared to that of 1983 was as follows: 108.15% in 1987, 117.24% in 1988 and 124.63% in 1989. The rate of development in the previous years in Kabupaten Bangka was as follows: 8.41% in 1988 and 6.30% in 1989. Excluding tin GRDP in 1989 was 153,203 million rupiah, an increase of 178.01% compared to 1983 and of 11.76 % compared to 1988 (137,081 million rupiah).

239. The biggest contributor to GRDP including tin is the sector of trade, followed by industry and mining. The percentage of each sector was 30.81%, 28.82%, and 19.69% respectively. Excluding tin, trade accounted for 30.83% and agriculture for 34.96%.

3) Kabupaten Belitung

240. In Kabupaten Belitung, GRDP including tin in 1988 based on the current prices was 127,845 million rupiah which meant that compared to 1983(62,845 million rupiah) it increased by 203.43%.

The growth of GRDP of 1988 increased by 20.83% compared to that of 1987. GRDP excluding tin in 1988 based on the current prices was 110,114 million rupiah which meant that compared to 1983(52,826 million rupiah) it increased by 100.84%. The growth of GRDP in 1988 increased by 12.71% compared to that of 1987. (See Table 2-9-5A, 2-9-6A)

241. At constant 1983 prices(62,845 million rupiah), GRDP in 1988 (83,319 million rupiah) increased by 132.58% compared to that of 1983. The productivity of the years before compared to that of 1983 was as follows: 111.63% in 1986, 123.36% in 1987 and 132.58% in 1988. The rate of development in the previous years in Kabupaten Belitung was as follows: 10.51% in 1987 and 7.48% in 1988. Excluding tin GRDP in 1988 was 70,741 million rupiah which increased by 129.03% compared to 1983(54,826 million rupiah) and by 106.27% compared to 1987. The biggest contributor to GRDP is the sector of trade. The percentage of the sector of trade was 25.46% and next was agriculture(20.88%).

(4) Road Conditions and Number of Vehicles

242. The influence of transportation on economic activities becomes more important.

If the stream of commodity runs stiffly, transactions become weak which means economic activities are not smoothly handled. In other words, if transportation run well, the stream of commodities and transactions will go smoothly. Besides, a well-organized system of transportation will stimulate the opening of isolated places. The role of transportation is to make the flow of people, goods and services smooth and to stimulate and support the production of goods and services growth.

243. The type and length of road in 1989 are as follows: state-road- 1,017.80 km, provincial road- 2,18.10 km, and kabupaten road- 7,604.27 km.

In terms of road condition, 4,790.19 km or 42.62% is in good condition, 3,963.57 km or 35.26 % is moderate, 2,486.41 km or 22.12% is damaged. Regarding the road surface, it was observed that 4,804.98 km or 42.75% is covered with asphalt, 1,973.53 km or 17.56% with gravel, 4,461.66 km or 39.69% earth. (See Table 2-9-7A)

244. In 1989 the length of the road network at the Kotamadya Palembang reached 295.973 km. In terms of the surface condition, 95.08% or 281,423km are asphalt, while 4.92% or 14,550km are earth. The road condition in the same year indicates that 41.174 km is in the good condition, 230.586 km in moderate condition, 24.213 km in damaged condition. (See Table 2-9-8A)

245. Road length in Kabupaten Bangka (1989) is 1,449.72 km. Concerning the road surface, 359.89 km or 24.82% is asphalt and 1,089.83 km or 75.18% is earth. In 1989, road length in Kabupaten Belitung was 573.40 km. Concerning road surface 232.75 km (40.59%) is asphalt road and 340.45 km (59.41%) is earth road. (See Table 2-9-9A, 2-9-10A)

2-9-2 Transportation Activities

(1) Air Transportation

246. Palembang, the capital city of South Sumatra Province, is the "Hub" of

the air network service for the region. There are six direct daily flight services from Jakarta. As for the connection to Pankal Pinang which is the main city in Bangka island and Tanjung Pandan located in the west part of Belitung island, there are direct flights seven times and twice a week respectively. Between Pankal Pinang and Tanjung Pandan there is no direct flight.

247. According to the O-D survey conducted by MOC in 1988, the volume of passenger transported by airplane is as follows.

Palembang - Pankal Pinang	42,485 persons/year
Palembang - Tanjung Pandan	13,677 persons/year
Pankal Pinang - Tanjung Pandan	9,038 persons/year

248. Based on Air Transport Statistics(1990), traffic volume handled at Pankal Pinang and Tanjung Pandan are as follows;

- Pankal Pinang -

Passenger Departure	77,179	Cargo Loaded	1,170,447 kg
arrival	78,010	Unloaded	1,315,124
Transit	8,056		

About 70% of departure passengers or 53,861 went to Jakarta, 16,865 passengers went to Palembang and 5,212 went to Tanjung Pandan. 18,688 arrival passengers came from Palembang and 6,204 came from Tanjung Pandan.

- Tanjung Pandan -

Passenger Departure	39,989	Cargo Loaded	535,059 kg
arrival	38,964	Unloaded	360,330
Transit	31		

About 70% of departure passengers or 27,824 went to Jakarta, 6,204 passengers went to Pankal Pinang and 5,231 went to Palembang. 5,500 arrival passengers came from Palembang.

(2) Sea Transportation

1) South Sumatera-Bangka

249. The existing ferry route between South Sumatra and Bangka island connects Palembang and Kayu Arang. The ferry port of Palembang is in Musi River, 80 km from the mouth and the terminal site is near the center of the city, from which it takes about 20 minutes by car(Fig 2-9-1A). The ferry

port of Kayu Arang is in Jering River, 17 km from the mouth.

The present ferry operation is as follows:

number of ferry boats; 2 vessels

number of trips daily: 2(night trip)

trip time: 12 hours

The distance of this route is 83 miles and the operation is conducted at night. Sometimes it arrives late at Kayu Arang when the tidal level is low and the ferry cannot pass through the mouth of Jering River where sea depth is nearly 1.0 m from LWS(Tidal rang (H.W.L-L.W.L) is about 3.8m and the drafts of two ferries are 1.65m and 2.12m.)

250. Since the ferry service started in 1986 with new mooring facilities, dredging has not been executed around the mouth of Jering River. Table 2-9-11A shows the number of trips made in October, 1991, 16 times from Palembang to Kayu Arang, and zero from Kayu Arang to Palembang. The reason for zero trip in the latter was a fog; the ferry was forced to call at Muntok Port, 20 miles westward from the mouth of Jering River, according to the document of the shipping company. (The number of passengers was 491 persons; the volume of cargo was 60 tons, the number of vehicles was 65 units from Muntok to Palembang in October, 1991.)

251. Comparing the difference in the number of calls from Kayu Arang to Palembang and from Palembang to Kayu Arang, it is assumed that the number of calls to Muntok Port was 104 times in 1990 and 42 in 1991. (This change in the number of calls did not occur in 1989) It is not clear but it seems that high number of calls to Muntok Port is not always due to a dense fog. Most ferry's users are from Pangkal Pinang terminal station and are informed of the change in the departure port at the terminal. The delay in arrival time and the frequent changes of the calling port is a weakness in this ferry route.

252. From Tables 2-9-12A and 2-9-13A, the current tendency of this ferry route shows:

- a) the number of passengers per one trip from Palembang to Kayu Arang has not changed in these three years, but the number of passengers from Kayu Arang to Palembang decreased by half in 1991 compared with the number in 1990,
- b) the number of vehicles and the volume of cargoes from Palembang to

Kayu Arang are increasing year by year, but the volume from Kayu Arang to Palembang do not show any consistent trend.

253. In October, 1990, a high speed passenger boat with the capacity of 68 persons started operation between Palembang Port and Muntok Port; the distance between Palembang and Muntok is about 60 mile and the trip time is three hours(Toll of this boat is three times higher than that of the ferry boat). As shown in Table 2-9-14A, total number of passenger transported by this boat was about 31,400 in 1991. In November 1991, three passenger boats started operations. And now the frequency of operation on this route is four trips/day. It seems that the new operation of the passenger boats have had the influence on the decrease of the number of ferry passengers. Table 2-9-14A also shows the number of passengers transported by general cargo ships. According to the above data, about 66,000 passengers(one way) move in a year between Palembang and Bangka Island.

254. Table 2-9-15A shows the monthly data of general cargoes handled in Muntok Port, most of which are transported from/to Jakarta or Palembang.

According to the information obtained from Muntok Port Office, MOC, the contents of the cargoes transported to Palembang are fish, fruits, rubber and etc., and those from Palembang to Muntok are vegetables, manufactured foods,furnitures,and other commodities.

255. Based on the data from Ferry Passenger O-D Survey by Ministry of Transport, the distribution of passengers from Bangka island to Sumatera main island is estimated as follows;

from Pangkal Pinang	44%
from Bangka island(excluding Pangkal Pinang)	56%
to Palembang	65%,
to South Sumatera(excluding Palembang)	18%
to Sumatera island & other main islands (excluding South Sumatera)	17%

note) there were many passengers from Jawa Island,

256. The results of the interview survey conducted in the field survey are as follows:

- a) the most requested improvement was the increase of velocity followed by the improvement of services, the increase of trip frequency, appropriate food supply,
- b) of truck drivers boarding these ferries, most used the service once or twice a month, two drivers were coming from or headed to Jakarta,
- c) concerning the access means, most passengers from Bangka use a bus (that is mini-bus), they supposedly come from Pangkal Pinang, Sungaliat, Belinyu etc, far from Kayu Arang.

2) Bangka-Belitung Route

257. The existing ferry route between Bangka Island and Belitung Island connects Pangkal Balam and Tanjung Pandan. On both sides, there are not any exclusive facilities for ferry operation. Pangkal Balam Port is in Mentawang River, 6 km up from the mouth, 3 km northeast from Pangkal Pinang. The approach channel to Pangkal Balam Port is maintained at a depth of more than 4 meters, where dredging is repeated every two years at a volume of about 200,000 m³. In Pangkal Balam Port, there is a general cargo wharf with 188m length and -5m water-depth, where ferry boats moor in the interval of loading and unloading of cargoes.

258. Tanjung Pandan port is on the right side coast of the mouth of Cerucup river, and to maintain the required water-depth - 5m, dredging at a volume of 500,000m³ was practiced in 1989 and dredging is again planned in 1992. In the inner part of the port a wooden pier exists which is scheduled to be reconstructed for the use of passenger boat (New passenger terminal is being constructed now).

259. The present ferry operation is as follows:

number of ferry boat	2 vessels
one of which is used when the other is docking	
trip number weekly	4(night trip)
trip time	16 hours
distance of route	110 miles

260. Table 2-9-16A and Table 2-9-17A show the monthly data of this ferry route, from which the current tendency in this ferry route shows:

- a) the number of passengers is nearly 90 persons per one trip on both sides and if the capacity is assumed to be 146 persons (the capacity of the larger ferry boat operated in this route), the load factor is about 60 %,
- b) the number of vehicles(4-wheels) is only one unit per one trip on both sides,
- c) the volume of cargoes is nine tons from Pangkal Balam to Tanjung Pandan, and six tons from Tanjung Pandan to Pangkal Balam per one trip, which is a remarkable contrast to the case of the ferry route between Palembang and Kayu Arang, and in July to September all cargoes were transported without vehicles from both sides.

261. Table 2-9-18A shows the monthly data of passengers of Pangkal Balam Port in 1991, excluding ferry passengers. Among these data, LINA operates two round trips a week, the same as the ferry between Pangkal Balam and Tanjung Pandan. In this figure the actual trip number is not shown; considering two months of non-operation of ferry, average number of passengers per one trip is not so different between passenger boat and ferry boat. The destination of passengers from Pangkal Balam is almost exclusively Belitung Island or Jakarta. Table 2-9-19A shows the monthly data of passengers of Tanjung Pandan Port in 1991, excluding ferry passengers.

262. Table 2-9-20A shows general cargo data of Pangkal Balam Port. The volume of total domestic cargoes is about 360,000 ton, and import/export cargo volume is about 41,000 tons, the contents of exported cargoes are white pepper, kaolin, rubber, timber, fish. The general cargo data in Tanjung Pandan is not shown in the figure; the volume of total domestic cargoes is about 450,000 ton, and import/export cargo volume is about 73,000 ton. The contents of exported cargoes are kaolin and tin raw material.

263. The results of the interview survey are as follows:

- a) the most requested item of improvement is increased velocity followed by increased trip frequency, the construction of a specialized ferry port etc.,
- b) comparing data on trip purpose for both routes, it is assumed that a

considerable number of passengers work in Belitung and live in Bangka. The peak of frequency on this ferry route use is two times a month.

2-9-3 The Result of the Interview Survey on Passengers of Ferry Boat(1) (Palembang to Kayu Arang)

(1) Opinions and requests of passengers

(27th(Monday) of January,1992, the number of answers is 34)

Increasing velocity	10 persons
Increasing trip frequency	4 persons
Improvement of service	6 persons
Adequate supply of food	2 persons

(2) Frequency of passenger use on this ferry route

(28th(Tuesday) of January,1992, the number of answers is 33)

twice a week	4 persons
once a month	3 persons
twice a month	3 persons
twice a year	2 persons
three times a year	1 person
twice a year	13 persons
once a year	4 persons

(3) Trip purpose

(28th(Tuesday) of January,1992, the number of answers is 33)

home/relatives	20 persons	school	2 persons
work	4 persons	private	1 person
business	0 person	others	6 persons

(4) Access means to ferry terminal

(28th(Tuesday) of January,1992,the number of answers is 33)

by bus	15 persons	by taxi	10 persons
others	2 persons	by automobile	6 persons
automobile driver a) Palembang to Bangka			
twice a year/home/relatives			
automobile driver b) Palembang to Bangka			

twice a year/others
 automobile driver c) Jakarta-Palembang to Bangka(Jubus)
 twice a month/others
 automobile driver d) Palembang to Bangka
 once month/work
 automobile driver e) Jakarta-Palembang to Bangka
 twice a week/others

2-9-3-2 The Result of the Interview Survey on Passengers of Ferry Boat(2)

(1st(Saturday) of February,1992, Kayu Arang to Palembang)
 (The number of answer is 42)

(1) Frequency of passenger use on this ferry route

twice a week	1 person
once a week	2 persons
twice a month	6 persons
once a month	15 persons
twice a year	13 persons
once a year	4 persons

(2) Trip purpose

home/relatives	24 persons	school	12 persons
work	8 persons	private	0 person
business	5 persons	others	4 persons

(3) Access means for ferry terminal

by bus	34 persons	automobiles(driver)	2 persons
truck(driver)	3 persons	motorcycle	1 person
bicycle	1 person		

truck driver a) from Bangka-Palembang to Jakarta
 once a month /business

truck driver b) from Bangka to Palembang
 twice a month /work

truck driver c) from Bangka(Pangkal Pinang) to Palembang
 twice a month /work

automobile driver a)	from Bangka to Palembang
	twice a week/business
automobile driver b)	from Bangka to Palembang
	twice a month/business

2-9-3-3 The Result of the Interview Survey on Pasengers of Ferry Boat(3)

(1ST(Saturday) of February,1992, Muntok to Palembang)

(1) Frequency of passenger use on this passenger-boat

once a week	2 persons
twice a month	2 persons
once a month	3 persons
four times a year	1 person
three times a year	1 person
twice a year	1 person
for the first time	5 persons

(2) Trip purpose

home/relatives	9 persons	school	4 persons
work	0 person	private	1 person
business	4 persons	others	2 persons

(3) Access means for ferry terminal

by bus	16 persons	by taxi	1 person
on foot	2 persons		

2-9-3-4 The Result of the Interview Survey on Passengers of Ferry Boat(4)

(31st of January,1992, Pangkal Balam to Tanjung Pandan)

(1) Frequency use passenger on this ferry route

twice a week	1 person
twice a month	4 persons
once a month	2 persons

twice a year	2 persons
once a year	1 person

(2) Trip purpose

home/relatives	9 persons	school	0 person
work	0 person	private	0 person
business	1 person	others	0 person

(3) Access means for ferry terminal

by taxi	4 persons	by bus	3 persons
by truck(driver)	1 person		
truck driver	a) from Pangkal Balam to Tanjung Pandan		
	b) twice a week /business		

2-9-3-5 The Results of the Interview Survey on Passenger of Ferry Boat(5)

(1st of February,1992, Tanjung Pandan to Pangkal Balam)
(The number of answers is 20)

(1) Opinions and requests of passengers

Increasing velocity	6 persons
Increasing trip frequency	2 persons
Guarantee of water supply	1 person
Provision of a spare ferry boat	
for docking	1 person
Improvement of ramp way of a ferry	1 person
Improvement of access road	1 person
Construction of a specialized port	1 person

(2) Frequency of passenger use on this ferry route

twice a week	5 persons
once a week	2 persons
twice a month	11 persons
twice a year	2 persons

(3) The purpose of trip

home/relatives	2 persons	school	2 persons
work	10 persons	private	1 person
business	1 person	others	7 persons

(4) Access means for ferry terminal

by bus	17 persons	by taxi	1 person
by truck(driver)	1 person	by motorcycle	1 person

truck driver a) from Tanjung Pandan to Bangka
twice a week/business

