

**THE MINISTRY  
OF AGRICULTURE  
INDONESIA**

**JAPAN INTERNATIONAL  
COOPERATION AGENCY,  
JICA**

**SOUTH SULAWESI  
REGIONAL AGRICULTURAL DEVELOPMENT  
PLANNING / ATA - 140 PROJECT**

**FINAL REPORT ON PHASE I  
VOLUME II**

**THE PRESENT SITUATION & PROBLEMS OF  
AGRICULTURE IN SOUTH SULAWESI PROVINCE**

**February - 1979**

**THE TEAM OF THE PROJECT ON SOUTH SULAWESI RADP/ATA-140  
IN UJUNG PANDANG**

STANFORD UNIVERSITY  
LIBRARY

STANFORD UNIVERSITY  
LIBRARY

JICA LIBRARY  
  
1055830[2]

STANFORD UNIVERSITY LIBRARY

**THE MINISTRY  
OF AGRICULTURE  
INDONESIA**

**JAPAN INTERNATIONAL  
COOPERATION AGENCY,  
JICA**

**SOUTH SULAWESI  
REGIONAL AGRICULTURAL DEVELOPMENT  
PLANNING / ATA - 140 PROJECT**

**FINAL REPORT ON PHASE I  
VOLUME II**

**THE PRESENT SITUATION & PROBLEMS OF  
AGRICULTURE IN SOUTH SULAWESI PROVINCE**

**February - 1979**

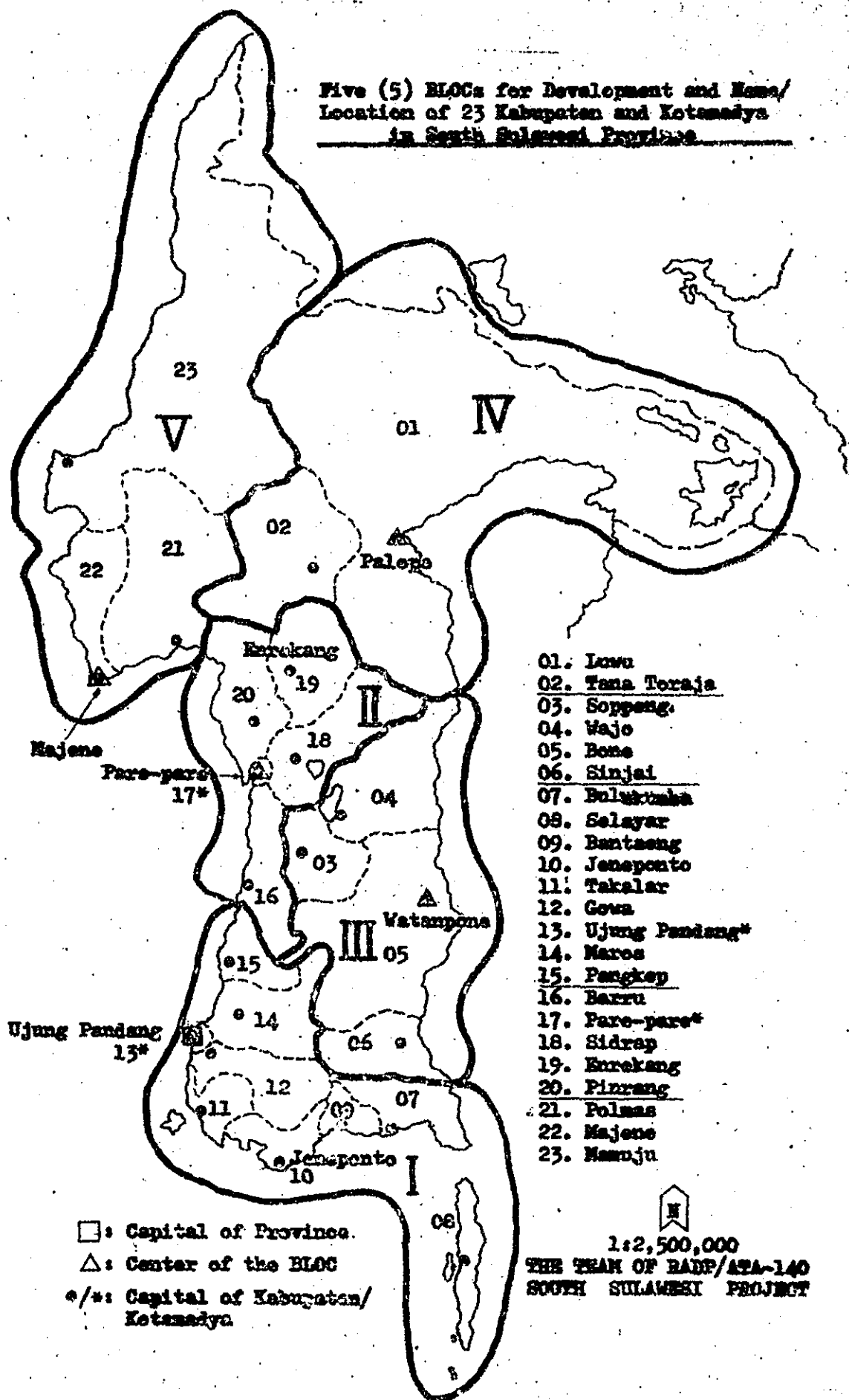
**THE TEAM OF THE PROJECT ON SOUTH SULAWESI RADP/ATA-140  
IN UJUNG PANDANG**

Received from  
ADT

Received from  
ADT

国際協力事業団	
受入 月日 '84. 3. 23	108
登録No. 01822	80.7 ADT

**Five (5) BLOCs for Development and Name/  
Location of 23 Kabupaten and Kotamadya  
in South Sulawesi Province**



- 01. Iauu
- 02. Tana Toraja
- 03. Soppang
- 04. Wajo
- 05. Bone
- 06. Sinjai
- 07. Bulukumba
- 08. Selayar
- 09. Bantaeng
- 10. Jeneponto
- 11. Takalar
- 12. Gowa
- 13. Ujung Pandang\*
- 14. Maros
- 15. Pangkep
- 16. Barru
- 17. Pare-pare\*
- 18. Sidrap
- 19. Enrekang
- 20. Pinrang
- 21. Palmas
- 22. Majene
- 23. Mamuju

□ : Capital of Province.  
 △ : Center of the BLOC  
 ●/\* : Capital of Kabupaten/  
 Kotamadya

1:2,500,000  
 THE TEAM OF RANP/ATA-140  
 SOUTH SULAWESI PROJECT

C O N T E N T S

Introduction 1.

PART I: Summary

- 2. Present situation and problems 4.
- 2.1. Location, area and nature 4.
- 2.2. Population 5.
- 2.3. Labour force and employment structure 7.
- 2.4. The economy and industry 8.
- 2.5. Demand and supply of staple food stuff 11.
- 2.5.1. Estimation of the demand for food stuff in 1981 11.
- 2.5.2. Evaluation of programmes for rice production in Repelita II 16.
- 2.5.3. Present change in the demand structure and regional production structure, and the tendency of decline in secondary crops production 18.
- 2.6. Animal husbandry and fishery 21.
- 2.7. Cash crops and forestry 22.

PART II: Back ground of the agriculture in South Sulawesi Province

- 3. Regional characteristics in Indonesia 23.
- 3.1. Introduction 23.
- 3.2. Population and population density 25.
- 3.3. Economy 26.
- 3.4. Industry 29.
- 3.5. Social overhead capital 29.
- 4. Physical feature 32.
- 4.1. Introduction 32.
- 4.2. Climate 34.
- 4.2.1. Rainfall 34.
- 4.2.2. Others 40.
- 4.3. Geology, soil and topography 43.
- 4.3.1. Geological condition 43.
- 4.3.2. Soil condition 46.
- 4.3.3. Topography 47.
- 4.4. Water resources and drainage 49.

- 4.4.1. Estimation of the total amount of the water 49.
- 4.4.2. Irrigation system and areas 50.
- 4.4.3. Availability of agricultural water 53.
- 4.4.4. Drainage 55.
- 4.5. Availabilities of land use and land utilization in the future 56.
  - 4.5.1. Present condition of land use 56.
- 5. Socio-economic condition in South Sulawesi 61.
  - 5.1. Population 61.
  - 5.2. Labour force and employment structure 72.
    - 5.2.1. Present labour force and employment structure 72.
    - 5.2.2. Estimation of agricultural labour employment 77.
  - 5.3. Non agricultural industry 79.
    - 5.3.1. Mining 79.
    - 5.3.2. Manufacturing 79.
    - 5.3.3. Trade and distribution 80.
  - 5.4. Income distribution 85.
    - 5.4.1. Introduction 85.
    - 5.4.2. Income distribution 85.
    - 5.4.3. Income distribution in the agricultural sector 86.
  - 5.5. Land holding 92.
    - 5.5.1. Number of farm household and farms 92.
    - 5.5.2. The conditions of land holding 92.
  - 5.6. The situation of integrated rural development 96.
    - 5.6.1. General informations 96.
    - 5.6.2. Transmigration 102.
    - 5.6.3. Resettlement 107.
  - 5.7. Needs of farmers 109.
    - 5.7.1. Definition of farmers 109.
    - 5.7.2. Reclamation investment 110.
    - 5.7.3. Marketing system development 111.
    - 5.7.4. Opinions of Bupati-s of specific Kabupaten-s 112.
- 6. Marketing and transportation service for agriculture 116.
  - 6.1. Marketing of farm products 116.
    - 6.1.1. The relation of city and villages in South Sulawesi Province 116.
    - 6.1.2. Distribution of supply area and shortage demand area by commodity 120.

- 6.1.3. Monthly supply of main food stuffs 126.
- 6.1.4. Movement of prices for farm products 128.
- 6.1.5. Systematic problems on the agricultural marketing 132.
- 6.1.6. A summary of comment on marketing and processing by a short-term Expert 134.
- 6.2. Communication and transportation 137.
- 7. Administration of agricultural extension service 139.
- 7.1. National, provincial and local governmental services 142.
- 7.1.1. National 142.
- 7.1.2. Provincial 142.
- 7.1.3. Kabupaten and Kecamatan 145.
- 7.2. Agricultural institution 147.
- 7.2.1. Rural Extension Center/R.E.C. 147.
- 7.2.2. Agricultural extension service 147.
- 7.2.3. Agricultural information center 148.
- 7.3. Other services for farmers 150.
- 7.4. Agricultural education and training 154.
- 7.4.1. The agricultural education 154.
- 7.4.2. Personnel training 154.
- 7.4.3. The agricultural counselling 155.
- 7.5. Conclusion 157.
- 8. Present situation of agricultural development by Bloc 158.
- 8.1. Main characteristics of each Bloc 158.
- 8.2. Present situation of food stuff production 159.
- 8.3. Priority of regional agricultural development 161.
- 8.4. Outline of Bloc I: the South Development Bloc 168.
- 8.5. Outline of Bloc II: the West Development Bloc 171.
- 8.6. Outline of Bloc III: the East Development Bloc 172.
- 8.7. Outline of Bloc IV: the North Development Bloc 174.
- 8.8. Outline of Bloc V: the Mandar Development Bloc 175.

PART III: Agricultural condition of South Sulawesi

- 9. Production structures of the agricultural sector 178.
- 9.1. Food crops 178.
- 9.1.1. Paddy/rice 178.
- 9.1.2. Cropping intensity and secondary crops 201.
- 9.1.3. Change of the demand structure and the regional production structure 207.
- 9.1.4. Vegetables and fruits 210.



- 9.2. Estate crops (Industrial crops) 217.
- 9.2.1. Potential areas 217.
- 9.2.2. Present land utilization for farming of estate crops 217.
- 9.2.3. Productive elements 225.
- 9.2.4. Income distribution, farm price and marketing cost 227.
- 9.2.5. Marketing 228.
- 9.2.6. Extension and other services 228.
- 9.2.7. Conclusion and suggestion 231.
- 9.3. Animal husbandry 232.
- 9.3.1. General activities for developing animal husbandry 232.
- 9.3.2. Improvement of livestock 233.
- 9.3.3. Grass-land improvement in South Sulawesi Province 241.
- 9.3.4. Development of feeding the cattle and poultry 246.
- 9.3.5. Demand and supply of the husbandry products 248.
- 9.3.6. Improvement of feeding 250.
- 9.3.7. Conclusion 252.
- 9.4. Fisheries 253.
- 9.4.1. Inland fishery 253.
- 9.4.2. Coastal fisheries 268.
- 9.4.3. Off-shore fisheries 269.
- 9.4.4. Recommendations 272.
- 9.5. Forestry 277.
- 9.5.1. Condition of the forests in South Sulawesi Province 277.
- 9.5.2. Erosion control and conservation of water resources 279.
- 9.5.3. Forestry production 282.
- 9.6. Construction of irrigation systems 283.
- 9.6.1. The survey on the development of water resource 284.
- 9.6.2. The construction of new irrigation systems 284.
- 9.6.3. The rehabilitation of irrigation system 285.
- 9.6.4. The protection of rice field areas against floods 285.

\*\*\*\*\*

Volume II

LIST OF TABLES

- 1.1. Comparison between national & regional agricultural products during Repelita II 3.
- 2.1. Population increase rate and infant population rate by region 7.
- 2.2. Economically active population by insuarey (1971) 9.
- 2.3. Gross income development in the South Sulawesi Province 10.
- 2.4. G.D.P. by region (1972) 10.
- 2.5. Comparison of income in agricultural sector and in other sectors (1975) 10.
- 2.6. Measuring the average of population consumption by calory and protein per capita per day in South Sulawesi in 1975 13.
- 2.7. Estimation of the demand of food stuff in South Sulawesi Province (1981) 14.
- 2.8. Benefit of projects in increasing rice production 16.
- 2.9. Composition of food production (1964 - 1976) 19.
- 3.1. Population by region 25.
- 3.2. G.D.P. by region (1972) 26.
- 3.3. Distribution of regions by per capita RGDP and annual growth rates 28.
- 3.4. Major industrial indicators by region 30.
- 3.5. Infrastructure-related indicators by region 31.
- 4.1. Number of observation stations in South Sulawesi (1976) 34.
- 4.2. Acreage of paddy field by annual rainfall condition and by Bloc (1975) 37.
- 4.3. Specific discharge in South Sulawesi 49.
- 4.4. Irrigation system in South Sulawesi 1976 50.
- 4.5. Situation of paddy field in South Sulawesi (1975) 50.
- 4.6. Present condition of land use in South Sulawesi (1976) 56.
- 4.7. Present condition of land use in South Sulawesi (1976) 58.
- 4.8. Estimation of land use by Kabupaten in South Sulawesi 59.
- 5.1. Population growth in South Sulawesi 62.
- 5.2. Dependency ratio of South Sulawesi 64.
- 5.3. Population increase rate and infant population rate by region 65.
- 5.4. Population drain from South Sulawesi Province to pass through Ujung Pandang and Pare-pare Harbour (1967-76) 67.
- 5.5. Density of the provinces in D Zone (1971 & 1981) 69.

- 5.6. Literacy population (coyans more) in South Sulawesi Province by Kabupaten (1971) 70.
- 5.7. Economical active population in South Sulawesi Province and Ujung Pandang 74.
- 5.8. Economically active population by industry (1971) 76.
- 5.9. Unsuployment by industry (1971) 76.
- 5.10. Estimation by agricultural labor in 1971 - 1976 78.
- 5.11. Geographic distribution of manufacturing companies in South Sulawesi Province (1973) 80.
- 5.12. Imports of goods by South Sulawesi Province 83.
- 5.13. Exports by South Sulawesi Province 83.
- 5.14. Export realization in South Sulawesi (1973-1976) 84.
- 5.15. Comparison of income of agricultural and other sectors (1976) 86.
- 5.16. Distribution of gross product by sector in South Sulawesi Province (1969 - 1976) 90.
- 5.17. Distribution of regional net income and income per capita in South Sulawesi by Bloe 91.
- 5.18. Agriculture and estates farms in South Sulawesi 92.
- 5.19-1. Number of farms by tenure in South Sulawesi (1973) 94.
- 5.19-2. Nuumber and area of farms by size of holding in South Sulawesi (1973) 95.
- 5.20. Level of village development in Sulawesi Selatan 1972 - 1976 97.
- 5.21. The level of vililage development per Kabupaten in South Sulawesi (1975) 98.
- 5.22. Land productivity in the villages in each Kabupaten in South Sulawesi (1975) 99.
- 5.23. Livelihood of the vililage population per Kabupaten in South Sulawesi 100.
- 5.24. Kecamatan Lokasi UDKP 1977/1978 101.
- 5.25. Settled transmigrant (by origin) until 1976 103.
- 5.26. Settled transmigrant (by arrined) until 1976 104.
- 5.27. Condition of the transmigrater's in Kabupaten Luwu (untill 1976) 105.
- 5.28. Developments in population of Kabupaten Luwu (1971 - 1976) 106.

- 5.29. The condition of resettlement in Kabupaten Jeneponto and Sinjai 108.
- 5.30. Spontaneous resettlement in Kabupaten Wajo (1977) 108.
- 6.1. Routes of farm products by commodities for each region 118.
- 6.2. Estimation of supply area and area of shortage (1976) 121.
- 6.3. Estimation of supply area and shortage area of major Sovel (1974 - 1976) 123.
- 7.1. Hist of agricultural extension service distribution plan PTS., PFM and PFU in the development of rural regions in South Sulawesi province 149.
- 7.2. Distribution of WILUD and their facilities in South Sulawesi Province 151.
- 7.3. Condition of development of WILUD until October 1977 in South Sulawesi Province 153.
- 8.1. Main characteristics of each Bloc 160.
- 8.2. Estimation of farm households by Bloc in South Sulawesi 160.
- 8.3. Land productivity and food production per capita by Bloc 162.
- 8.4. Production volume of food staff by Bloc 162.
- 8.5. Production volume of rice and secondary crops by Bloc 163.
- 8.6. Development of the gross value of food production by Bloc 163.
- 9.1. The acreage of paddy planted areas by period and season in South Sulawesi Province (1974 - 1976) 180.
- 9.2. Acreage of farm lands in South Sulawesi Province (1975) 181.
- 9.3. Acreage of the planted areas with paddy Gogo by Kabupaten and year in South Sulawesi Province (1969-1976) 183.
- 9.4. The acreage of paddy harvested areas by period and season in South Sulawesi Province (1974 - 1976) 185.
- 9.5. Acreage of the harvested areas of the paddy Gogo by Kabupaten and year in South Sulawesi Province (1969 - 1976) 186.
- 9.6. The acreage of damaged areas by period and season in South Sulawesi Province (1974 - 1976) 188.
- 9.7. Production of rice by season (1974 - 1976) 191.
- 9.8. Production of the paddy gogo by Kabupaten and year in South Sulawesi Province (1969 - 1976) 192.

- 9.9. Condition of the employed by age group in agricultural sector in South Sulawesi Province (1976) 195.
- 9.10. Estimation and number of labor employment in the South Sulawesi Province by region in 1961 and 1971-1977 196.
- 9.11. Development of the use of fertilizer in the South Sulawesi Province during the period (1969 - 1970 through 1976-1977) 197.
- 9.12. Development of the use of pesticides in the South Sulawesi Province during the periods 1969-1970 through 1976-1977 197.
- 9.13. Development in the use of top variety seeds during the Pelita I and II in South Sulawesi Province 198.
- 9.14. Percentage of the use of top variety rice crops in the acreage of crops in South Sulawesi 199.
- 9.15. Developments in using the agricultural machinery in South Sulawesi Province (1973-1977) 200.
- 9.16. Acreage planted to secondary crops in South Sulawesi (1976) 203.
- 9.17. Corn production in South Sulawesi 203.
- 9.18. Peanut production in South Sulawesi 204.
- 9.19. Production of beans in South Sulawesi 205.
- 9.20. Cassava production in South Sulawesi 205.
- 9.21. Sweet potato production in South Sulawesi 206.
- 9.22. Percentage of food stuff production during the period 1964 - 1976 207.
- 9.23. Production volume and main production area (1976) 211.
- 9.24. Fruit production volume and its main production areas (1976) 213.
- 9.25. Acreage of planted area, production and yield of estate crops by the farmers in South Sulawesi Province (1969) 219.
- 9.26. Acreage of planted area of estate crops by the farmers in South Sulawesi Province (1976) 220.
- 9.27. Production, yield and number of household of estate crops by the farmers and average gross income per household by production of estate crops in South Sulawesi Province (1976) 221.
- 9.28. Number of estate and acreage in South Sulawesi Province (1977) 223.
- 9.29. Distribution of estate by Kabupaten in South Sulawesi Province (1977) 224.

- 9.30. Acreage of planted area by commodity in South Sulawesi Province (1977) 224.
- 9.31. Amount of fertilizer requirement and used for cultivation of coconut and coffee in South Sulawesi Province (1974 - 1978) 225.
- 9.32. Amount of pesticide requirement and used for cultivation of coconut and coffee in South Sulawesi Province (1974 - 1978) 226.
- 9.33. Average prices of coconut, copra and coffee by type of price in South Sulawesi Province (1969 - 1976) 227.
- 9.34. Amount of volume of copra by interinsular trade of South Sulawesi Province (1969 - 1976) 228.
- 9.35. Seed gardens of industrial Crops Retention service 230.
- 9.36. P.M.U.C.W.U. in South Sulawesi Province 230.
- 9.37. Disease situation in South Sulawesi 1972-1976 233.
- 9.38. Vaccination 234.
- 9.39. Beef-cattle rearing in South Sulawesi Province 1975/1976 235.
- 9.40. Total and reallocation of PUPP in South Sulawesi Province budget year 1976/1977 237.
- 9.41. Location and target of artificial insemination in South Sulawesi 238.
- 9.42. Poultry farm in South Sulawesi Province 1976 and 1977 240.
- 9.43. Required pasture by head and by day 241.
- 9.44. Carrying capacity of grassland in South Sulawesi Province 242.
- 9.45. Gross seedling garden in South Sulawesi Province 243.
- 9.46. Table of livestock population in South Sulawesi Province 1969 - 1977/1977 245.
- 9.47. Present land utilization and potential area and estimation of production 254.
- 9.48. Projection Development of fishery production in South Sulawesi Province (1973 - 1983) 255.
- 9.49. Production of fishery sub sector in South Sulawesi Province 256.
- 9.50. Acreage of brackish water fish ponds by type of in South Sulawesi Province (1975) 258.

- 9.51. Comparison of cost and benefit in the management of brackish water fish ponds by types of management per ha. each year in the South Sulawesi Province 260.
- 9.52. Potentiality of coastal aquaculture in South Sulawesi Province 261.
- 9.53. Total number of government al hatchery and farmers hatchery and its production of fry in South Sulawesi Province 265.
- 9.54. Condition of fishery in Kabupaten Tator 266.
- 9.55. Fishery Production and Exported fish in Wajo 267.
- 9.56. Condition of fish capturing equipments, the types of vessels used and the amount of fishery products in the waters of South Sulawesi 270.
- 9.57. Composition of fish species captured in the waters of South Sulawesi Province 271.
- 9.58. Income per unit of equipment and fishermen 273
- 9.59. Distribution and utilization of forest lands in South Sulawesi Province 278.
- 9.60. Acreage and distribution of bare/critical lands in South Sulawesi Province 280.
- 9.61. Acreage and distribution of forestation in South Sulawesi Province during the Pelita I and II 281.
- 9.62. Acreage and location of H.P.H forests by concessionaire in South Sulawesi Province 282.

LIST OF FIGURES

- 2.1. Estimation of food crops and population in South Sulawesi 6.
- 2.2. Development of rice production and average yield per ha. in South Sulawesi 17.
- 2.3. Fluctuation of prices by commodity in South Sulawesi (1969-1976) 19.
- 2.4. Production development of corn and cassava 20.
- 2.5. Planted acreage of corn and cassava 20.
- 3.1. Growth poles and geographical division in Indonesia 24.
- 3.2. Map of Indonesia expressed in terms of economic magnitude, 1972 27.
- 4.1. Annual rainfall in South Sulawesi 35.
- 4.2. The relativity of yield with annual rainfall in Kabupaten Wajo, Bulukumba and Sidrap (1969-1976) 39.
- 4.3. Paddy cultivation by season in South Sulawesi 41.
- 4.4. Caserved record at Ujung Pandang 42.
- 4.5. Contour map of South Sulawesi 44.
- 4.6. Geological condition in South Sulawesi 45.
- 4.7. Soil condition in South Sulawesi 48.
- 4.8. Condition of irrigated area by Bloc in South Sulawesi 52.
- 5.1. Growth of population 63.
- 5.2. Composition of population by age group (1971) 63.
- 5.3. Percentage of people engaged in economic activities by age group (South Sulawesi, 1971) 73.
- 5.4. Weight of regional income by sector in South Sulawesi 68.
- 5.5. Weight of income by sub-sector of agricultural sector 88.
- 5.6. Fluctuation of rice price (1969 - 1973) 89.
- 5.7. Fluctuation of net value of sub-sectors' products (1969 - 1973) 89.
- 6.1. (6.1.1. - 6.1.5.) Shortage and surplus area of agricultural products 124.
- 6.2. Condition of monthly supply of main food stuffs in South Sulawesi (1974 - 1977) 127.
- 6.3. Consumer price of rice and producer price of dried and un-husked rice (1976 - 1977) 129.
- 6.4. Price fluctuation of rice by Kabupaten (1976) 130.
- 6.5. Price fluctuation of onion by Kabupaten (1975-1976) 130.



- 6.6. Difference of price of tomatos, coconuts and beef (1973/1975) 131.
- 6.7. Flow of goods and trucks (1974) 138.
- 6.8. Road conditon by surface at present (1976) 138.
- 6.9. Major bridges reconstruction program (1976) 138.
- 8.1. Five Development Blocs of South Sulawesi 158.
- 8.2. Increase rate of gross value of food crop production 164.
- 8.3. Harvested area of Rendengan 164.
- 8.4. Development of food production's gross value per farmer in South Sulawesi by Bloc 165.
- 8.5. Balance of food supply and demand by Bloc 166.
- 8.6. Balance of total demand and supply of food in South Sulawesi 167.
- 9.1. Production and yield of rice by season in South Sulawesi (1973/74 - 1976) 190.
- 9.2. Fluctuation of prices by commodity (1969-1976) 208.
- 9.3. Gross income fluctuation (Rp/ha) by commodity (1969 - 1976/ farmers level) 208.
- 9.4. Trend/index of total volume by commodity (1969-1976) 209.
- 9.5. Trend/index of farmers' gross income (per ha) (1969 - 1976) 209.
- 9.6. Cultivation season of main vegetables with climate condition (Jakarta) 214.
- 9.7. Cultivation season of main vegetables with climate condition (Manila) 215.
- 9.8. Cultivation & ecology of chinese cabbage in the level land of the tropical zone 216.
- 9.9. Pattern of cultivation in coll highlands of the tropical zone 216.
- 9.10. Temperatures and potato cultivation season 216.

\*\*\*\*\*

## INTRODUCTION

1001. This Volume II of the Final Report on the first phase is a revised edition of the material provided as the Annual Report I/1977 during the period of the first stage of the first phase. Based on the result of the analysis on the regional agricultural development in South Sulawesi Province, described in the Annual Report, the basic figures for a plan have been finalized by the Team in the First Quarterly Report/1978.

1002. These figures were used by on-the-job training for the accumulation of a regional agricultural development plan in the second stage of the first phase. By repeated trial and error, the abilities would be improved by self-training on the endeavours of the officials by themselves. In the second stage of the first phase, the Team has formulated a integrated plan for the regional agricultural development, presenting the recommendations on the review of Repelita II (Refer to table 1.1.).

1003. In order to cope with the change of circumstances in the future national economy, the regional planner has to possess a flexible ability to alter the components and system of the regional planning formulated, by categories based on the circumstances under which the regional plan was formulated. In this point of view the items are as follows:

- 1) Basic figures towards a regional agricultural development plan;
- 2) Some problems of regional agriculture; and
- 3) Implemented countermeasures for the agricultural sector during Repelita II.

1004. Besides the targets of Repelita III, the following ones should particularly be considered in collecting data for the regional agricultural development planning. The targets of Repelita III of South Sulawesi under consideration at present are as follows:

1005. (1) Developing of South Sulawesi into the Top Granary in Indonesia: If the productivity of rice fields is raised to 2.5 tons per ha. (on cleaned rice basis) and rice production of 1,250,000 tons is achieved, a surplus of about 500,000 to 600,000 tons would occur, whereby 25 to 20 % of the demand for rice in Eastern Indonesia except for South Sulawesi can be supplied. Moreover, if expansion of irrigation facilities is promoted, it will be possible to heighten such ratio to 50 %.

1006. (2) Developing of South Sulawesi into the Center of sugar production and its trade in Eastern Indonesia. At present, a sugar factory (annual production: 30,000 tons) is in operation in Bone. Other than this

factory, it is considered possible to construct one factory, respectively in Bone, Takalar and Pangkep. Once those factories are established, it would be possible to expect a sugar production on an annual scale of 120,000 tons. On the other hand, the demand for sugar in Eastern Indonesia at that time will be 80,000 to 90,000 tons.

1007. (3) Developing of South Sulawesi into the Center of stock-raising and meat export. By taking the most of the advantages of South Sulawesi such that the corn planting area is as large as 350,000 ha. and the production of soy bean is 10,000 tons, feed factories should be established and cattle breeding promoted. It is estimated that the number of cattle in South Sulawesi will reach 1,140,000 in the year 1978. Since the consumption of beef in the same area is only 4 to 6 % of the estimated supply, it is possible to use the remainder as canned meat for export, and also hide and bones for export.

1008. (4) Making of South Sulawesi into the Center of agricultural production, trade and export in Eastern Indonesia (palm, clove, pepper etc).

1009. (5) Making of South Sulawesi into the Center of production and trade of construction material: Development of various / fields such as cement (expansion of Tonasa factory), steel bars, tile and sawings, should be conducted.

1010. Finalizing this introduction, it must be cleared that in this Volume there are some paragraphs or chapters have been quoted from Report of the study on Ujung Pandang Industrial Estate (published by the JICA) as follows: Chapter 3, Paragraph 4.1. of Chapter 4 and Paragraphs 5.1., 5.2. and 5.3. of Chapter 5. Although quoted paragraphs/chapters, some statistic numbers are changed and some parts are added or cut based on researchs and analyses by the Team.

Table 1.1. Comparison Between National & Regional Agricultural Products during Republic II

No. Item	National (A)		Regional (B)		Units: 1,000 tons/heads & %	
	1973	1978	1973	1978	1973	1978
<b>1. Food crops</b>						
- Paddy	14,455	18,183	871	1,251	6	6.8
- Corn	2,600	4,150	343.1	209	13	5
- Sorghum	55	240	-	-	-	-
- Cassava	9,900	12,750	302.5	395	3	3.1
- Soy bean	495	670	4.2	4.8	0.8	0.7
- Green gram	65	90	12.8	19.2	19.7	21.3
<b>2. Industrial crops</b>						
- Rubber	829.3	935.0	0.9	1.5	0.1	0.2
- Palm oil	300.1	518.0	-	-	-	-
- Copra	1,270.0	1,320.0	-	-	-	-
- Coffee	210.3	248.8	5.3	9.1	2.5	3.6
- Tea	54.4	87.3	-	-	-	-
- Clove	15.4	27.6	0.007	1.0	0.04	3.6
- Pepper	28.0	32.0	0.1	1.8	0.35	5.6
- Cotton	3.0	30.0	-	29	-	96
- Tobacco	68.1	85.3	3.8	28.7	5.6	33.6
- Nutmeg	9.6	15.8	0.005	1.3	0.05	9.4
- Cinnamon	6.4	10.4	-	-	-	-
- C a p o k	25.0	37.0	1.2	7.0	4.6	18.9
- Cocalate	2.0	2.4	0.025	1.6	1.2	66.6
- Rosella/Knaf	9.9	20.7	3.7	9.0	37.4	43.5
- S u g a r	991.6	1,356.0	0.8	1.6	0.08	0.12
<b>3. Livestock 1,000 head</b>						
- Cattle	6,400	7,200	38.2	1,135.9	6.8	15.8
- Buffalo	2,800	3,100	364.9	675.6	13	21.8
- G o a t	6,900	4,800	236.2	1,379.7	3.4	16.4
- Sheep	2,900	4,300	3.9	19.7	0.1	0.5
- P i g	3,500	4,800	352.2	3,438.9	10	69.7
- Chicken	85,000	125,000	4,759.6	-	5.6	-

## PART I

### SUMMARY

#### 2. Summary of Present Situation & Problems

##### 2.1. Location, Area and Nature

2001. The island of Sulawesi is located approximately in the centre of Indonesia, which spans a distance of about 5,000 km. from the east to the west. The island is divided into four provinces. According to the 1971 Census, the South Sulawesi Province has an area of 92.8 thousand km<sup>2</sup>. (62.9 km<sup>2</sup>. according to the Agrarian Office) and accounts for 36% of the entire Sulawesi Island area. The South Sulawesi Province is separated from the Central Sulawesi Province by the Verbeek mountain range at the North, and faces the Strait of Makassar, the Flores Sea and the Gulf of Bone. The South Sulawesi province extends from 0.85° Southern Latitude to 7° Southern Latitude, and the 120 th parallel of the Eastern Longitude passes through the centre of the province.

2002. With its high temperature and frequent rainfalls, the province belongs to the tropical zone, and is sustainable to monsoons. Temperatures and the amount of rainfall differ from sub-region to sub-region, but in the west half the dry season lasts from June to October; the wet season which lasts from November to March accounts for over 70% of annual rainfall.

2003. The temperature is high throughout the year, at an average of 26.4°C, 31.8° at its highest (August through October) and 21.7°C at its lowest in Ujung Pandang. Humidity is also high. Ujung Pandang city has an average humidity of over 90% from December through February and about 50% from August through October. Ujung Pandang and the western parts of South Sulawesi are visited alternatively by the 6-month easterly monsoon and the 6-month westerly monsoon. The two monsoons correspond to the dry and wet seasons. During the dry season, easterly and southeasterly winds blowing from Australia are dominant, while during the wet season, westerly and northwesterly winds blowing from the Asian continent are dominant.

2004. As a consequence, the dry and wet seasons are reversed in the eastern and the western parts of South Sulawesi. The time lag in rice planting and harvesting in both parts of the province facilitates the seasonal movement of farm hands. The province suffers few natural calamities such as earthquakes, tidal waves or storms. During the wet season, however, there are damages from intensive heavy rains in some areas.

2.2. Population

2005 Current estimation of the province's population shows a number of nearly 5.4 millions (1976) or about one third of the population of D-zone (Western Indonesia such as North Sulawesi, Central Sulawesi, South Sulawesi, Southeast Sulawesi, West and East Nusa Tenggara, Maluku and Irian Jaya), and only 4% of the whole population of Indonesia.

2006. The province's population growth is characterized by the following points :

1) Low rate of increase.

During the decade of 1961 to 1971, South Sulawesi population increased at an annual rate of 1.4%, compared with the national average which is over 2%; according to data from 1971 to 1976, the annual rate of population increase in the province was 1.6%, compared with 2.4% of the nation as a whole (Refer to Fig 2.1.).

2) High dependent burden coefficient.

2006.2. The dependent burden coefficient (i.e. the ratio of the non-working age group to the working age group - 10 to 64 years in Indonesia) for the whole nation is 52.9%, and 55.7% in South Sulawesi. This means that in order to raise per capita income, South Sulawesi must bear a dependent burden which is 2.8% higher than the national average.

3) Female population is larger than the male.

2007. Indonesian male population is 4.9% smaller than the female. In South Sulawesi province, the gap expands to 6.5% averagely and to 16.5% in the age group of 15 to 44 years.

4) There is a rapid population outflow.

2003. The three facts above come from the population outflow that took place during 1961-1971. Generally, a change in population is determined by natural increase (births minus deaths) and social increase (inflow minus outflow). However, there is no reason to believe that the natural increase rate of the South Sulawesi population was higher than that of other provinces.

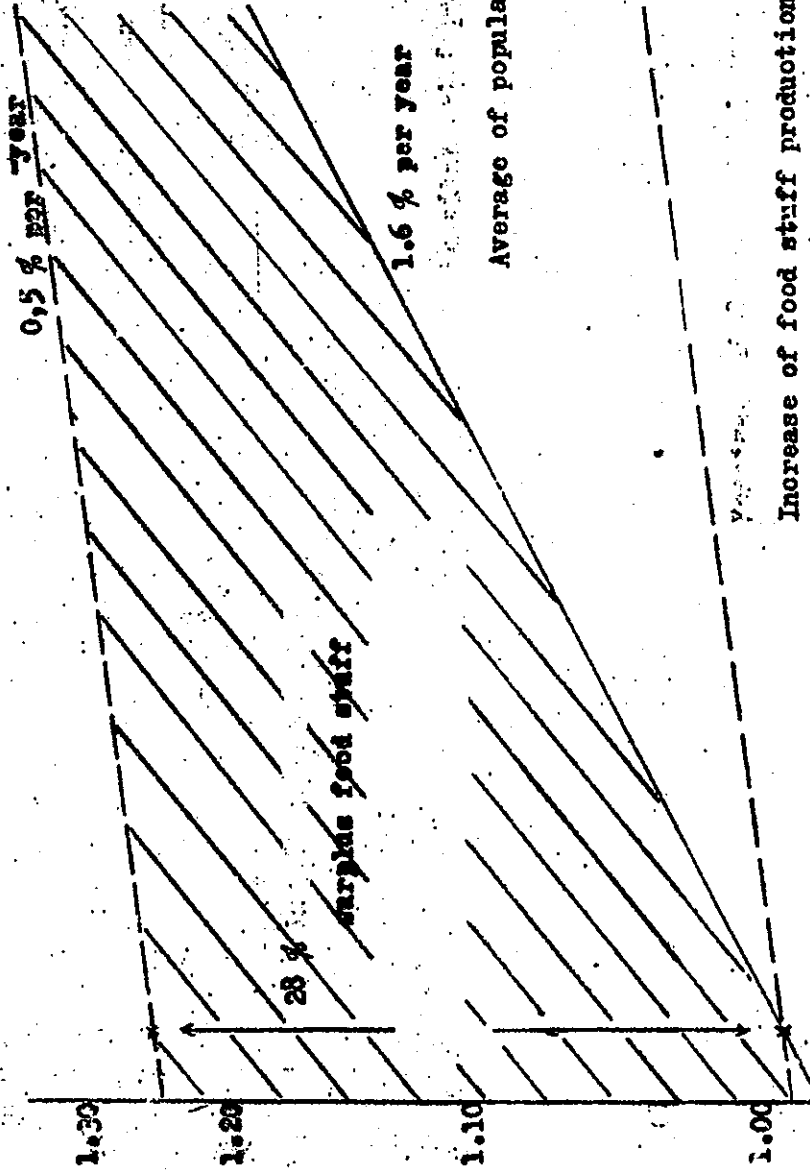
5) An average rate of natural increase.

2009. In table 2.1., which compares some indexes regarding natural increases of population, the rate of infant population is the highest in Sulawesi island and average in South Sulawesi province, and the rate of female productive ages (15 to 44) against the total population is the highest in South Sulawesi. These facts provide no reason to believe that

FIG. 2.1.

Estimation of feed crops and population in South Slavias

Average of feed stuff production



1969 70 71 72 73 74 75 76 79 84

there is a low rate of natural increase in the South Sulawesi population. 2010. Fig. 2.2. shows the composition of the national total population and that of the South Sulawesi Province by age group. The higher percentage of children under 9 indicates the rapid growth of population in recent years. Children's percentage in South Sulawesi is higher than that of the national average. And according to the population compositions, the exodus of population is particularly indicated in the productive age group (15 to 44 years).

Table 2.1. Population Increase Rate and Infant Population Rate by Region

Classification	(1) Total population (1000)	(2) Annual increase '61-'71	(3) 0-4 age (1000)	(4) 15-44 female (1000)	(5) Infant	(6) (4)/(1)	(7) (3)/(4)
Total	119,232	2.08	20,018	26,126	0,168	0,219	0,766
Java, Madura	76,103	1.91	12,271	17,496	0,161	0,230	0,701
Sumatera	20,813	2.83	3,745	4,148	0,181	0,199	0,903
Kalimantan	5,152	2.31	845	1,091	0,164	0,212	0,775
Sulawesi	8,535	1.92	1,564	1,866	0,183	0,219	0,838
South Sulawesi	5,180	1.40	873	1,222	0,169	0,236	0,714

Source : prepared from the 1971 Census.

### 2.3. Labour force and employment structure

2011. According to the 1971 Census, the population older than 10 years in South Sulawesi was 3,460 thousand, or 2/3 of the province's total population. The economically active population was 1,140 thousand or 27% of the total population and 41% of the working age population in the province.

2012. In this province, workers in Indonesian basic industry, agriculture, account for 2/3 of the total working population, followed by the workers of government agencies and services which account for nearly 10%, and commerce and manufactures which account for 7 to 8%, respectively, of the total number (Refer to table 2.2.).

2013. In terms of Colin Clark's industrial classification, the percentages of primary, secondary and tertiary industries come to 66 : 8 : 26 in the province, and 8 : 12 : 80 in Ujung Pandang city.



2014. Since the city embraces a small agricultural area only, the percentage of primary industry is naturally low. However, the very high percentage of tertiary industry is not so much the result of a high level industrialization as that of the retarded development of secondary industry.

#### 2.4. The Economy and Industry

2015 The province's gross product accounts for about 3% of gross national product (excluding the petroleum industry). Although the figure is lower than the national average (3.9% for 26 provinces), it is the highest in Eastern Indonesia. The composition of gross regional products by industry presents a pattern similar to that across the country (Refer to table 2.3.).

2016. Income per capita of South Sulawesi in 1972 was about 73% of the national average, and this implies that the province was behind the nation's average income per capita (Refer to table 2.4). On the other hand there is a large income differential among each industry, such as shown in table 2.5. Income per capita in the agricultural sector is only 68% against that of non-agricultural sectors.

2017. The relative weight of the manufacturing industry in the provincial economy is estimated at about 5% and it remains to be developed. However, under Polita I and Repolita II, the industry has grown rapidly. The industries' production increased at an annual rate of 25.4% from Rp. 7.6 billion in 1968 to Rp. 29.6 billion in 1974.

2018. Interinsular trade of the South Sulawesi province depends heavily upon agricultural production, because agricultural products such as rice and sugar are the main items of trade. Interinsular trade fluctuates from millions of Rupiahs to hundred millions of Rupiahs from year to year, and the trade's balance is always in favour of the South Sulawesi province. The province has the strongest trade relations with West Java and East Java, followed by those with North Sulawesi and North Sumatra.

2019. Generally speaking, the distribution system in the province still remains to be developed and thus hampers the development of production activities. Producer's price for rice, copra and sugar cane, for instance, are held very low, discouraging producers and hampering the expansion of production. As the copra price is low, there will be no rapid increase in its production. Farmers do not have sufficient funds of their

Table 2.2. Economically Active Population by Industry (1971)

	Urban Area		South Sulawesi		Total		Urban Bandung	
	1,000	%	1,000	%	1,000	%	1,000	%
Agriculture, Forestry & fishery	49,172	20.7	866,945	75.5	936,117	55.3	10,701	7.7
Mining	465	0.2	524	0.1	990	0.1	365	0.3
Manufacturing	18,167	7.7	86,142	7.3	104,309	7.3	10,610	7.6
Power, gas, water service	523	0.2	515	0.1	1,038	0.1	457	0.3
Construction	7,453	3.2	6,308	0.5	13,771	1.0	5,724	4.1
Commerce, hotel	52,165	22.0	58,721	5.0	110,886	7.9	33,041	7.4
Transport, communication	20,900	8.8	22,205	1.9	43,105	3.1	16,062	11.6
Banking, insurance	1,660	0.7	669	0.1	2,329	0.2	1,578	1.0
Services	67,109	28.3	69,799	5.9	136,908	9.7	45,399	32.7
Unclassifiable	19,414	8.2	42,440	3.6	61,854	4.3	10,259	7.4
Total	237,059	100.0	1,174,268	100.0	1,411,327	100.0	138,976	100.0

Source : 1971 Census.

Table 2.3. Gross Income Development in the South Sulawesi Province

Year	Total million	Agricultural Sector Sub-total million	Percentage %	per-farmer Rp.	Per- capita Rp.	Population 000
1969	88,300	55,400	60	-	-	-
1970	101,700	61,100	60	-	13,500	4,517
1971	119,700	64,900	54	-	12,500	5,180
1972	135,700	79,700	55	-	15,100	5,292
1973	192,900	103,900	55	-	20,155	5,296
1974	269,300	151,500	56	-	28,400	5,339
1975	368,800	205,600	56	-	37,800	5,446
1976	464,500	261,100	56	-	46,200	5,654

Source: 1969-1973

1974-1976 Estimation by the Team.

Table 2.4. G.D.P. by Region (1972)

	R.G.D.P. million Rp.	% Composition	Per capita 000 Rp.	R.G.D.P. National average	100
J a v a	2,417	59	31.8	92	
S u m b a w a	913	22	43.9	128	
M a l i n d a w a	324	8	62.9	183	
S u l a w e s i	215	5	25.0	73	
O t h e r s	231	5	26.8	78	
T o t a l	4,097	100	34.4	100	

Source: Bulletin of Indonesia Economic Survey Vol. XI No. 1, 1975.

Table 2.5. Comparison of Income in Agricultural Sector and in Other Sectors (1975)

Sector	person		Income		Per capita	
	000	%	million Rp.	%	Rp.	%
Agriculture	1,029	67	205,300	57	199,800	64
O t h e r s	523	33	163,200	43	312,000	100
T o t a l	1,552	100	368,800	100	237,600	-

Source: Self analysis from data of the BAPPANA and Department of Manpower.

own and are forced to sell their products at low prices, often immaturely. In urban areas, the distribution system is being modernized constantly, but it will take a long time before the wave of modernization reaches the rural areas.

## 2.5. Demand and supply of staple food stuff

2020. South Sulawesi is one of Indonesia's greatest agricultural and rice-producing areas. Approximately 80% of the province's population live in farming villages and more than 60% of total workers are engaged in the primary industry. Paddy fields amount to about 500,000 ha, and upland fields about 900,000 ha. Of all food crops, rice accounts for by far the largest percentage in terms of value, followed by corn, cassava, peanut, sweet potato, green pea, fruit and vegetables.

2021. In terms of dry rice production in 1976 amounted to about 950,000 tons, which accounted for about 70% of all food production. In terms of equivalence to rice, the average production of main food crops (rice, corn and cassava) in 1974-1976 amounted to 1,231,000 tons or 131% against the self-sufficiency volume of 937,000 tons. It was possible to ship main food crops amounting to 294,000 tons or 31% of the self-sufficiency volume to other province.

2022. Yet South Sulawesi's agricultural production increased at an annual rate of only 0.5% compared with the annual rate of population growth which was 1.6% (Refer to Fig. 2.1). In this way, the continuous supply to other province will yield trouble in the future.

2023. During the periods of Repelita I and Repelita II, agricultural policy was only concerned with rice production, and less attention was paid to other crops; thus, the increase rate of each crop from 1969-1971 to 1974-1976 was 17.0% of rice, -11.7% of corn and -2.6% of cassava, while for fruit and vegetables it was similar.

### 2.5.1. Estimation of the demand for food stuff in 1981

2024. Future demand for food stuff can be estimated on the basis of the projection of future population and the average dietary requirement for the normal health.

2025. According to the result of estimation by the Cohort Method, the South Sulawesi's population will reach a number of about 6 million in 1981. The average per capita energy intake is clarified by the Provincial Office of the Ministry of Health, as shown on table 2.6.

2026. Estimation by commodity in 1981 shows that the increase of yield per ha. or expansion of cultivated area are necessary to meet the demand of the increased population at the same level of energy intake as at present, for instance in rice production, as far self-sufficiency in South Sulawesi is concerned, it will be available even in 1981 refer to table 2.7.

2027. Since interinsular shipment to food deficient areas will not be able to be maintained as it is, the enlargement of yield and expansion of area are quite essential from the viewpoint to the national economy, and the way to carry on the responsibility of South Sulawesi as a rice bowl in D-zone should be examined in the development planning of the regional agriculture.

2028. Additionally, since cassava, green gram and soy bean are not enough to meet the Province's self-sufficiency, the increase of those products should be studied in the step of development planning. At the same time, demand for meat estimated is far beyond the available supply at present, particularly goat meat is likely to be very short but it is alternatively consumable with chicken meat. Thus the development planning on animal husbandry and grassland improvement should be taken into consideration.

2029. Fishery products, too, will not be enough for self consumption in South Sulawesi in 1981. Therefore, more expansion of fishery product facilities and infrastructures should be studied in the stage of development planning.

Table 2.5. Measuring the Average of Population Consumption by  
Calory and Protein per capita per day in South  
Sulawesi in 1975

No.	Name of stuffs	Average consumption (g.)	Calory (cal.)	Protein (g.)
1.	Rice	318.33	1,175.90	21.64
2.	Corn	56.58	202.96	4.84
3.	Cassava	121.47	177.54	1.45
4.	Sweet potato	4.52	5.31	0.07
5.	Peanut	12.63	56.83	3.15
6.	Green gram	4.84	16.64	1.16
7.	Soy bean	3.80	13.07	0.91
8.	Fresh fish	61.72	69.74	12.19
9.	Beef	4.24	8.77	0.79
10.	Buffalo meat	9.72	8.16	1.81
11.	Goat meat	1.89	2.77	0.29
12.	Eggs	8.05	13.04	1.02
Total		607.59	1,720.61	49.52

Source : Seksi Gizi hasil analisa data Sulawesi Selatan  
dalam angka tahun 1975.

Table 2.7. Estimation of the Demand of Food Stuff in South Sulawesi Province (1981)

Commodity	Per capita/day (kg)	Per capita/year (kg)	Total consumption (ton)	Total demand (ton)	Yield rate %	110% product (ton)
1. Rice	318.33	116.2	718,819	790,701	52	1,520,579
2. Corn	56.36	20.6	127,453	140,176	93	150,727
3. Cassava	121.47	44.3	274,042	301,446	80	376,808
4. Sweet potato	4.32	1.6	9,898	10,888	80	13,610
5. Peanut	12.63	4.6	20,456	31,302	60	52,170
6. Green gram	4.84	1.8	11,135	12,249	67	18,282
7. Soy bean	3.80	1.4	8,660	9,526	34	28,018
8. Fresh fish	61.72	22.5	139,186	153,105	61	250,992
9. Beef	4.24	1.5	9,279	10,207	51	20,014
10. Buffalo meat	9.72	3.5	21,651	23,816	45	52,924
11. Goat meat	1.39	0.7	4,330	4,763	50	9,526
12. Eggs	8.05	2.9	17,910	19,734	100	19,734
Total	1,569.31	521.6	1,370,829	1,507,913		2,513,384

- Note : 1) Population in 1981 is 6,186,054 (estimated by Cohort method)  
 2) Consumption average calory 1,720.51 and protein 49.32 gr per capita per day.  
 3) Loss of marketing and conveyance loss from farm give to consumer.  
 4) Slaughtering ratio 10% (Source : laporan tahunan Inspektorat Dinas Peternakan Dati I Sulsel.

Table 2.7 Estimation of the Demand of Food Stuffs in South Sulawesi Province (1981 / (Continued)

Commodity	Yield per unit (ton/ha)	Acreage needed	Unit (ha)	Acreage (unit) average in 8 years (ha)	+ -
1. Rice	2,709	561,506		563,940	2,634
2. Corn	0,690	218,445		245,430	26,985
3. Cassava	6,234	54,342		39,502	- 14,760
4. Sweet potato	4,349	3,129		11,854	8,725
5. Peanut	0,560	29,215		30,441	1,226
6. green gram	0,395	16,519		33,909	- 12,610
7. Soy bean	0,527	53,165		8,011	- 45,154
8. Fresh fish	-	250,992 ton		192,188 ton	- 58,804
9. B e e f	250 Kg	80,056 head		37,030 head	- 43,026
10. Buffalo meat	350	151,211		35,430	-115,701
11. Goat meat	17	560,353		25,030	-535,525
12. E g g	20 eggs/kg	394,600,000		-	-
13.	75 eggs/kg	5,262,400		7,380,862	+2,118,462

Source: 1) Yield rate - from no. 1 to no. 7 from Dinas Pertanian.

- Rakyat Prop. Sulsel.

-- No. 8 from Dinas Perikanan Prop. Sulsel.

- No. 9, 10, 11 from Majallah Pertanian (1976/1977 No. I/KXIV page 4).

2) Yield per unit

- from no. 1 to no. 7 Dinas Pertanian Rakyat Prop. Sulsel. (average 1968 - 1974)

- from no. 9 to no. 12 Dinas Peternakan Prop. Sulsel. (average 1968 - 1974).



2.5.2. Evaluation of Programmes for Rice Production in REPUBLICITA II

2030. Table 2.8 shows the benefit of projects in increasing rice production during Repelita I and II (1969-1976). According to the table, the great majority of benefit was attributable to the expansion of gadu paddy, possibly in irrigated areas. BIMAS/IRMAS, too, had a great contribution in increasing rice production, but it had the disadvantage of debt accumulation, as the credit from the BHI for BIMAS/IRMAS implementation was not able to be paid back yet.

2031. The actual increase of rice production volume by Gadu paddy was 117,400 tons ( $174,400 - 122,400 = 52,000$ ;  $52,000 + 65,400 = 117,400$ ), because most of the expanding areas of gadu were to change the season for cultivation (Refer to Fig. 2.2)

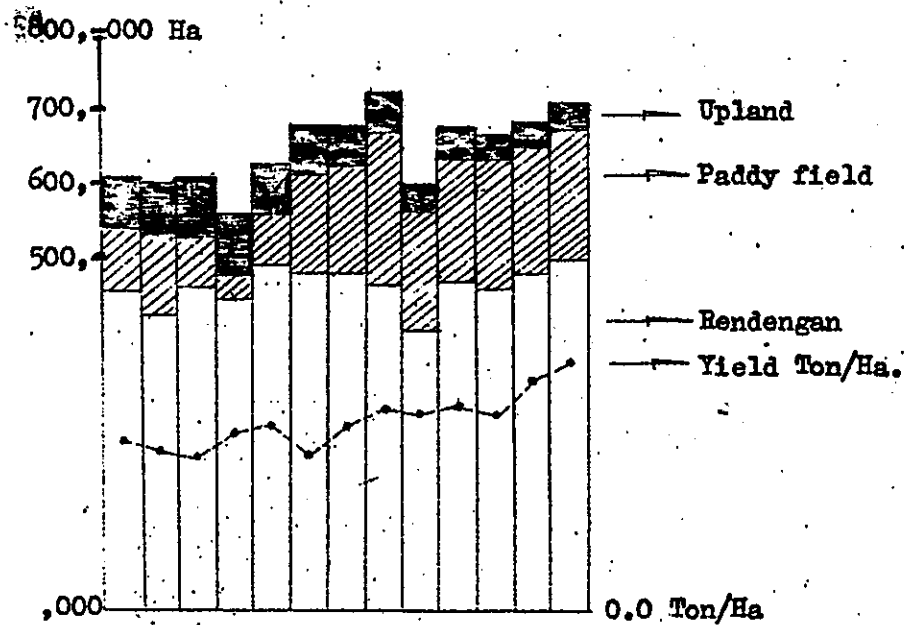
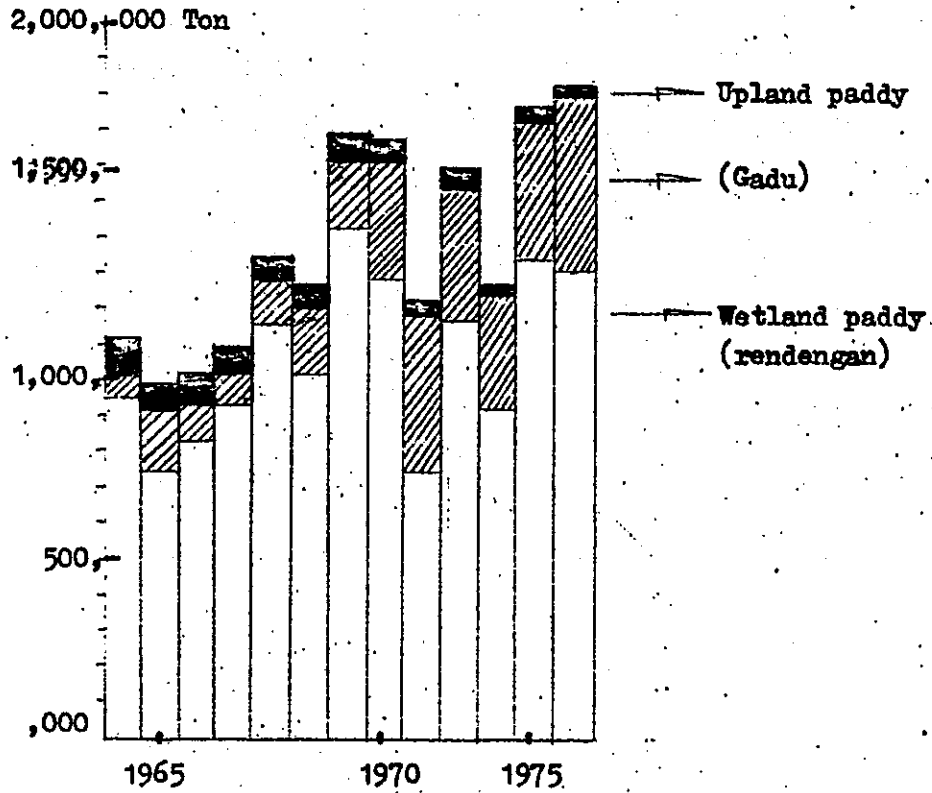
Table 2.8. Benefit of Projects in Increasing Rice Production

<u>Benefit of Projects</u>	<u>Annual Average</u>
1) Increasing production of gadu by area expansion	174,400
2) Increasing gadu yield by technical improvement	65,400
3) Reducing production by area	- 122,400
4) Increasing yield of wetland paddy (Rendengan) by technical improvement	109,300
5) Reducing upland paddy	- 39,300
<b>T o t a l</b>	<b>187,400</b>

Source : Estimation by the Team.

2032. It should be noted that the cultivated area been on the decrease in the past years, whereas farming population has been on the increase. As a result, the cultivated area per farming family has become smaller through division among father and son, and brothers, and other family members. More and more farmers cannot afford to have enough cultivated land. These farmers either go to cities to find jobs as seasonal labourers or go to Java island or other parts of the country. If agricultural production is to expand in line with the growth of other industries, it is important to cultivate the unused land to increase production of cash crops such as coffee, tobacco and spices.

**Fig.2.2. Development of Rice production and average yield per ha in South Sulawesi Province.**



Source : Annual Report of the South Sulawesi Agricultural Extension Service.

2.5.3. Present change in the demand structure and regional production structure, and the tendency of decline in secondary crop production

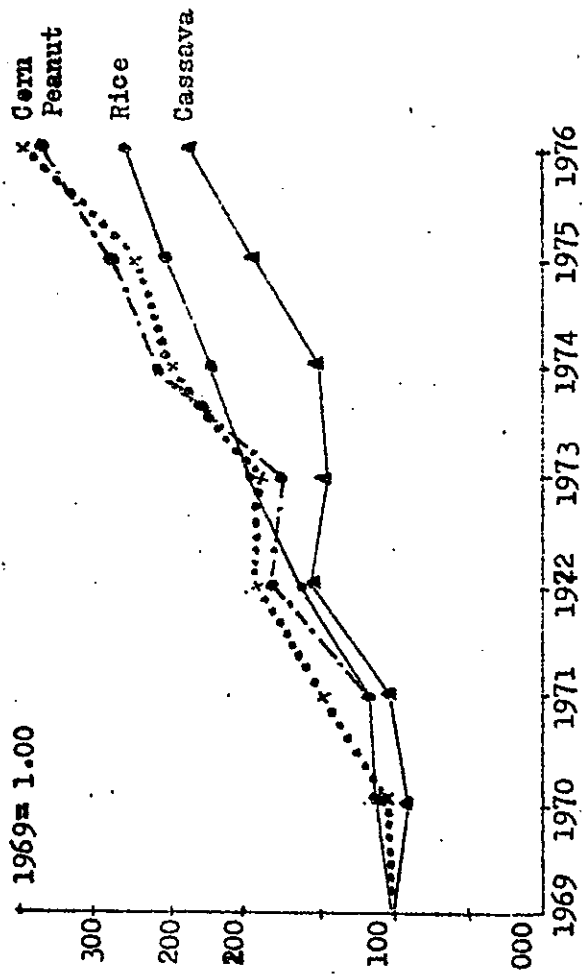
2033. The percentage of rice in the whole amounts (ton) of production in South Sulawesi keeps expanding, such as shown on Table 2.9, while the demand structure keeps changing, i.e., in the expansion of rice consumption, as people develop the preference for rice rather than corn and cassava. Thereby the productions of corn and cassava decline, in spite of the increased prices of these commodities. Particularly, the increase rate of the price of corn grows higher than that of rice (Refer to Fig. 2.3).

2034. The production of corn and cassava has a tendency to decrease year by year since 1964 (As shown in Fig. 2.4. 2.5). The unit price has been hiked because the production per ha. has also declined; consequently the gross income per ha. has been stagnant. The countermeasure to increase the productivity per ha. should be emphasized (Refer to Figs 2.3).

2035. Recently, land productivity of most staple food such as corn and cassava keeps declining, which case was not only due to socio-economic factors but to technical problems as well. The latter is a considerable problem particularly in marketing, because in export marketing, stabilized shipment quality and quantity of commodities are considerable factors for profitable trading. On the other hand, the annual rate of population increase is 1.6%.

2036. In the near future, even in the region there would probably be a shortage of food stuff, and many infrastructures and much budget will be required to increase rice production. If farm technique for other crops will also be raised, and yield per ha. by commodity is kept steady, the budget requirement would not be so large.

Fig. 2.3. Fluctuation of prices by commodity in South Sulawesi  
(1969 - 1976)



Source : Refer to Appendix II, table II.15 - 19

Fig. 2.4. Production Development of Corn & Cassava

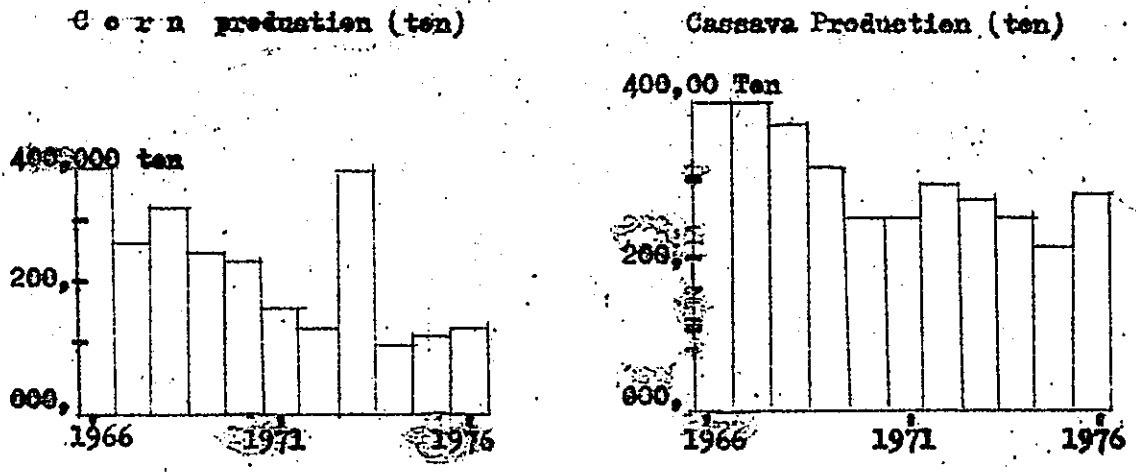
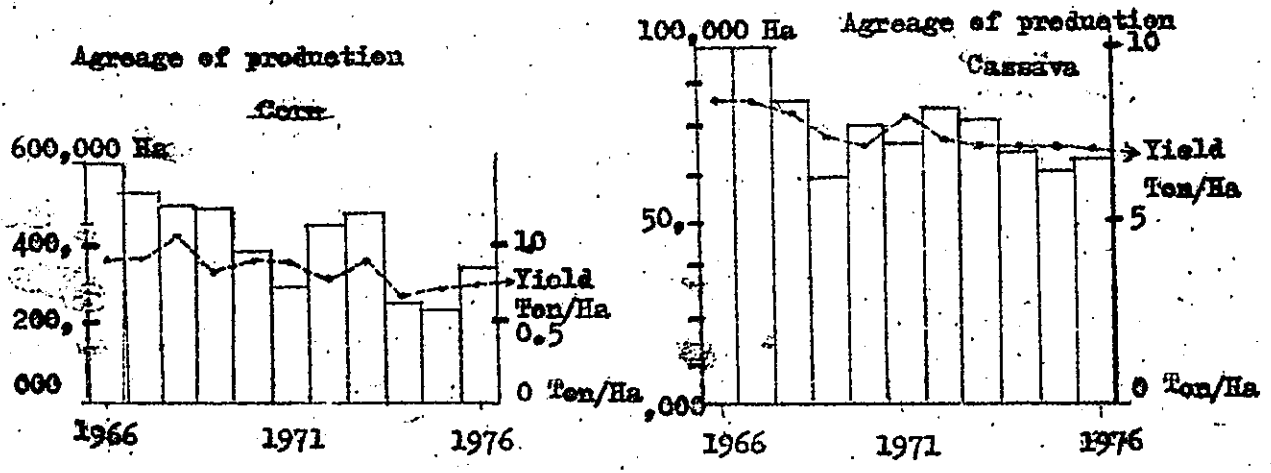


Fig. 2.5. Planted Acreage of Corn & Cassava



Source : Report by the agricultural Extension Service in South Sulawesi

2.6. Animal Husbandry and Fishery

2037. The majority of animal protein is taken from fish, and the annual supply per capita was 26.6 kg. of fish meat and 3.7 kg. of meat in 1976.

2038. During the periods of Repelita I and Repelita II, fish capture increased only slightly. However, since the beginning of the 1970-s fish price has risen rapidly and thereby the total value has grown sharply. Fish cultivation at lake Tempe was extensive before, but constant inflow of sand has reduced the depth of the lake by 10-20 cm. a year, and fish cultivation is becoming difficult in the lake.

2039. But a switch to shrimp cultivation in brackish water fish ponds is undergoing and the greatest composition of export value is occupied by shrimp today.

2040. Cattle raising is the backbone of livestock industry in the South Sulawesi province. In 1976 production amounted to about Rp 16.5 billion including cattle, buffaloes and other livestock. On the other hand, two large pasture land reclamation projects, respectively at Haiwa in Kabupaten Barru and at Siwa in Kabupaten Wajo, are run with a loan from the World Bank.

2041. However, there has not been so much of small pasture land or grass land improvement projects yet, and therefore animal husbandry development by small-scale farming remains stagnant. This does not merely imply big livestock but also small livestock such as goats and fowls. Particularly, small farmers graze their livestock in the homeyard only and don't use stable feeding. Cattle are also grazed in the paddy fields and uplands in the dry season and are pastured in the mountains in the wet season. Therefore the management of livestock is poor, and an urgent policy on the introduction of suitable livestock management in South Sulawesi need to be schemes for the development of livestock industry by small farmers.

2.7. Cash crops and forestry

2042. Copra accounts for approximately 60% of the total production of industrial crops. Formerly copra was distributed through Ujung Pandang, but today it is produced mainly in the North Sulawesi province. Palms are produced in such Kabupaten-s as Mamuju, Majene and Selayar. The next largest product in value is coffee, followed by tobacco and candlenut, but recently clove cultivation advanced rapidly.

2043. Most areas (86%) of industrial crops are managed by small-holders in the province and the Estate Crop Service fosters farmers' organizations, but the effects were not achieved because of the following reasons:

- 1) Low quality of cash crops due to poor production technique,
- 2) Complicated collection of cash crops from a large number of farmers; and
- 3) Delay of old tree juvenescence due to some sosio-economic situation such as the lack of finance or persistence of old custom between land-owners and tenant farmers.

2044. Wood production amounted to about 4.5 million m<sup>3</sup>, which was worth Rp 8.3 billion. The South Sulawesi province makes efforts to help raise industries of cane processing, lumbering and furniture. On the other hand, a large budget is given for greening in the forest areas by afforestation and reforestation. But the following reasons obstruct the progress of afforestation and reforestation:

- 1) Few silvicultural technicians and few workers;
- 2) Deficiency of transportation system as access to the planting area;
- 3) Delay in the examination of the proper tree in each region, and
- 4) Poor maintenance and fires in the planted areas

P A R T II

Back ground of the Agriculture in South Sulawesi

3. Regional Characteristics in Indonesia which is a 5,000 kilometer long archipelago, extending from east to west and consisting of more than 3,000 islands, can be summarized as the concentration of population and economy on the Java Island and the retarded development in Outer Java. Within Outer Java, socio-economic situations are different between Sumatera, Kalimantan, Sulawesi and Irian Jaya. In this section, the characteristic in the region centering on Ujung Pandang will be analyzed in comparing its various aspects with those other regions.

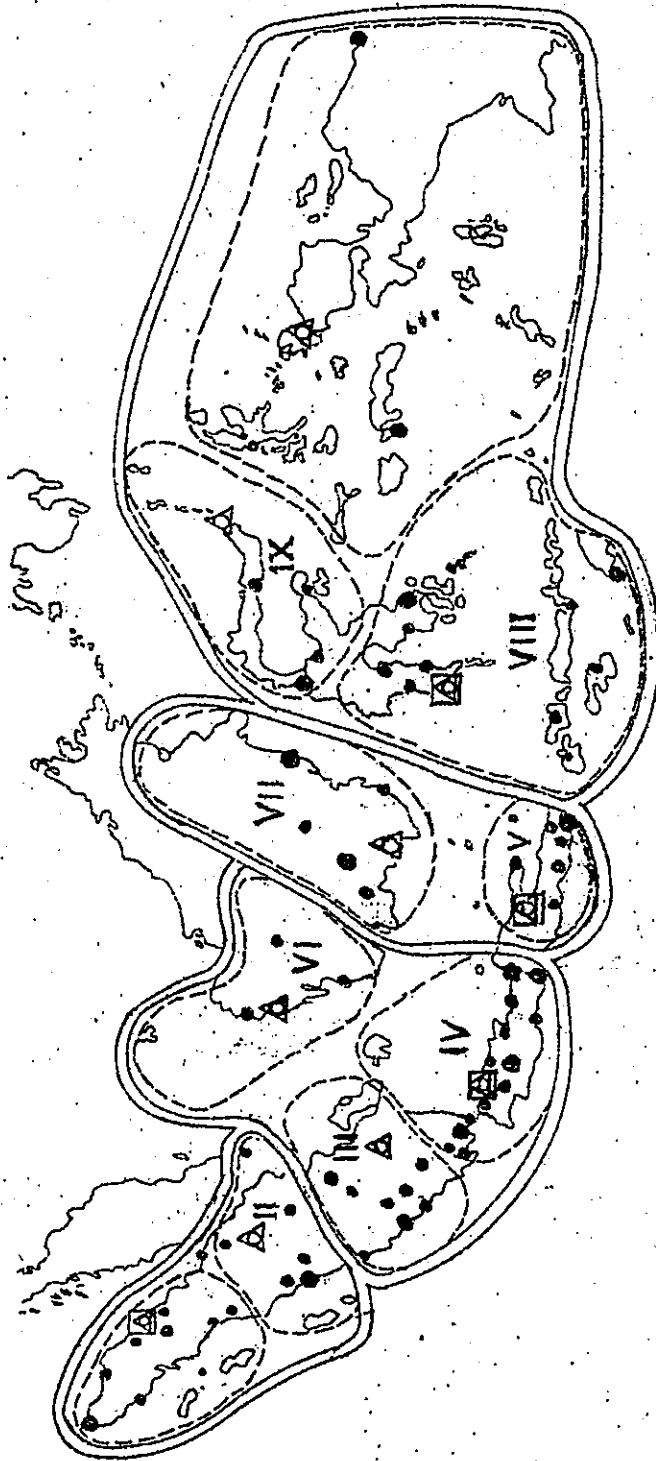
3002. Geographically, Indonesia is divided basically into 26 provinces. If the zoning to divide further these provinces is made, it will be extremely difficult to set up socio-economic indicators for the analyses. It is also somewhat troublesome to make comparison among 26 provinces at the same time. Such comparison will also lead to difficulty in obtaining an overall image. Therefore, the analyses here are made for the "regional bloc" which groups several provinces. The most clear-cut analysis can be made in making comparisons among such main islands as Java and Sumatera.

3003. Meanwhile, the Indonesian government has worked out the following plan to divide the country into several zones, to set up the regional center in each zone to concentrate development investment in the regional Center as "growth pole", and then improve economic and cultural standards in the surrounding area through the development at the growth pole. The zoning in this case is based on economic as well as cultural influences of the individual growth pole. Fig. 3.1. shows one example. In this figure, the country is divided roughly into four blocs, which are further divided into 10 sub-zones. The growth poles are classified into four grades based on the influencing area, which forms a pyramidal hierarchy. Growth pole in the four zones are from west to east Medan, Jakarta, Surabaya and Ujung Pandang. It is practical to make analyses of regional characteristics concerning these four regional zones.

3004. The analyses here are made centering on the comparison of characteristics among main islands. Analyses are also made for the above-mentioned four regional zones when the necessity arises.



Fig. 3.1. Growth Poles and Geographical Division in Indonesia



- (thick line) — WILAYAH PEMBANGUNAN UTAMA (A B C D)
- - - (dashed line) - - - WILAYAH PEMBANGUNAN (I - X)
- (square) PUSAT UTAMA WILAYAH PEMBANGUNAN UTAMA
- ▲ (triangle) PUSAT WILAYAH PEMBANGUNAN
- (circle) SUB PUSAT WILAYAH PEMBANGUNAN
- (dot) SUB-SUB PUSAT WILAYAH PEMBANGUNAN

A	I D.I. Aceh	C	V East Jawa
	II North West Sumatera		Bali
B	III Riau	D	VII Central Kalimantan
	IV Jambi		South Kalimantan
	V South Sumatera		East Kalimantan
	VI Bengkulu		West Nusa Tenggara
C	VII Lampung	D	VIII East Nusa Tenggara
	VIII D.K.I. Jakarta		South Sulawesi
	IX West Jawa		South East Sulawesi
D	X Central Jawa	D	IX North Sulawesi
	XI D.K.I. Yogyakarta		Central Sulawesi
E	XII West Kalimantan	D	X Maluku
	XIII East Kalimantan		Irian Jaya

3.2. Population and Population Density

3005. Sixty-five percent of the nation's total population concentrates on the Jawa Island which represents less than 10% of the total land area. The population density there is 401 persons per square kilometer, seven times the national average and 10 times that in Sumatera and Sulawesi. This shows clearly that Jawa is over populated, while Outer Jawa is dispersedly populated to a great extent. Population on the Sulawesi Island accounts for 70% of the national total, being the second largest in Outer Jawa after the Sumatera Island. As for the four regional blocs, population in zone D (East Indonesia) is the second lowest after Zone A, although the land area of this region is the largest among the four, and consequently the population density is the lowest.

3006. Annual rate of population increase between 1961 and 1971 was the highest in Sumatera, registering 2,8%, which was followed by 2,3% for Kalimantan and 1,9% each for Jawa and Sulawesi. However, 1% of Jawa's population represent 760,000, while 1% of Kalimantan's population is only 50,000. It is noticeable that the annual rate of population increase in zone D was 2,0%, almost equivalent to the national average, and the inflow and out-flow of population balanced.

Table 3.1. Population by Region

	1961		1971		1961-	Area 1.000 km <sup>2</sup>	Popu- lation density 1971 person/km <sup>2</sup>
	Population 1.000	Compo- sition %	Population 1.000	Compo- sition %	Annual incro- ase %		
1. Jawa	62,993	65	76,103	64	1,9	190	401
2. Sumatera	15,739	16	20,813	18	2,8	483	43
3. Kalimantan	4,012	4	5,153	4	2,3	543	9
4. Sulawesi	7,079	7	8,535	7	1,9	203	42
5. Others	7,106	8	8,629	7	2,0	569	15
Total	97,017	100	119,233	100	2,1	1,988	60
1. Zone A	10,148	10	13,067	10	2,6	262	50
2. Zone B	48,342	50	60,342	51	2,2	503	120
3. Zone C	26,127	27	30,780	26	1,7	456	68
4. Zone D	12,402	13	15,044	13	2,0	766	20

Source : INDIKATOR EKONOMI, 1976

3.3. Economy

3007. In Indonesia, it is extremely difficult to utilize macro economic indicators for each region. During the period of the Second Development Plan (REPELITA II), the Regional Income Research Group was organized. This group estimated the regional gross domestic product (RGDP) for each province in 1972, which is probably the sole economic indicator by region. Table 3.2. shows results of the estimates classified by main island and regional zone. According to this table, RGDP in Jawa accounted for 59% of Indonesia's GNP, while that in Sulawesi represented only 5%. Fig. 3.2. shows the map of Indonesia expressed in terms of economic magnitude (or RGDP), which clearly indicates the concentration of economic activities in Jawa.

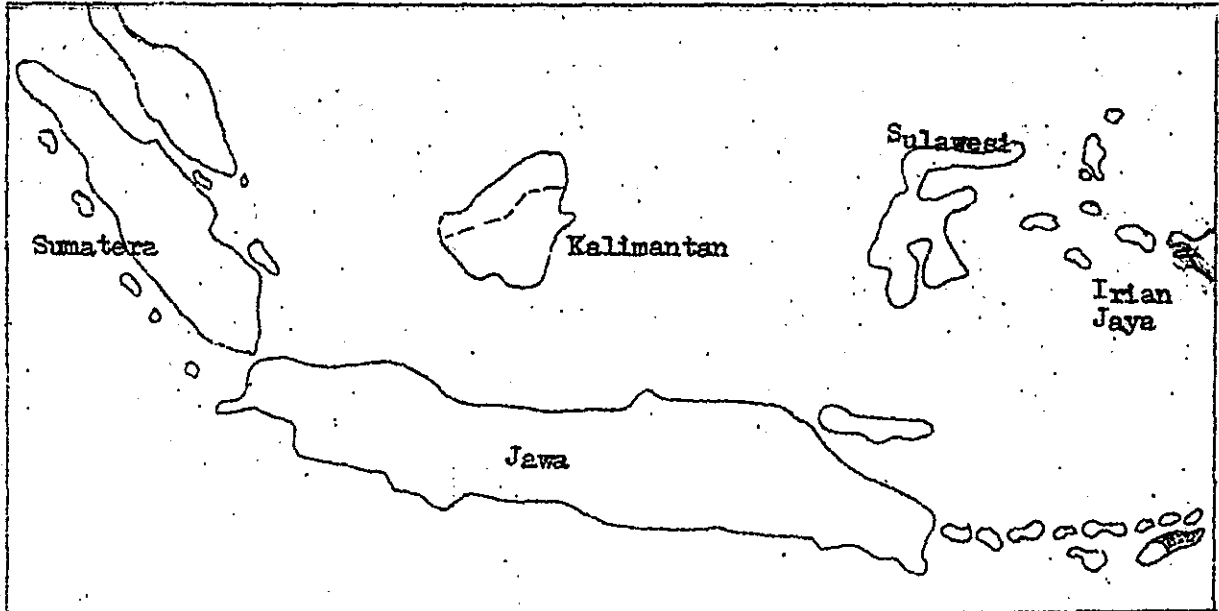
Table 3.2. GDP by Region (1972)

	RGDP		Per Capita RGDP	
	Billion rupiahs	Composition (%)	Rupiah	National Average-100
1. Jawa	2,417	59	31,760	92
2. Sumatera	913	22	43,870	128
3. Kalimantan	324	8	62,880	183
4. Sulawesi	213	5	24,960	73
5. Others	231	6	26,770	78
Total	4,097	100	34,360	100
1. Zone A	604	15	46,220	135
2. Zone B	1,829	45	30,310	88
3. Zone C	1,284	31	41,720	121
4. Zone D	380	9	25,260	74

Note : Oil sector excluded.

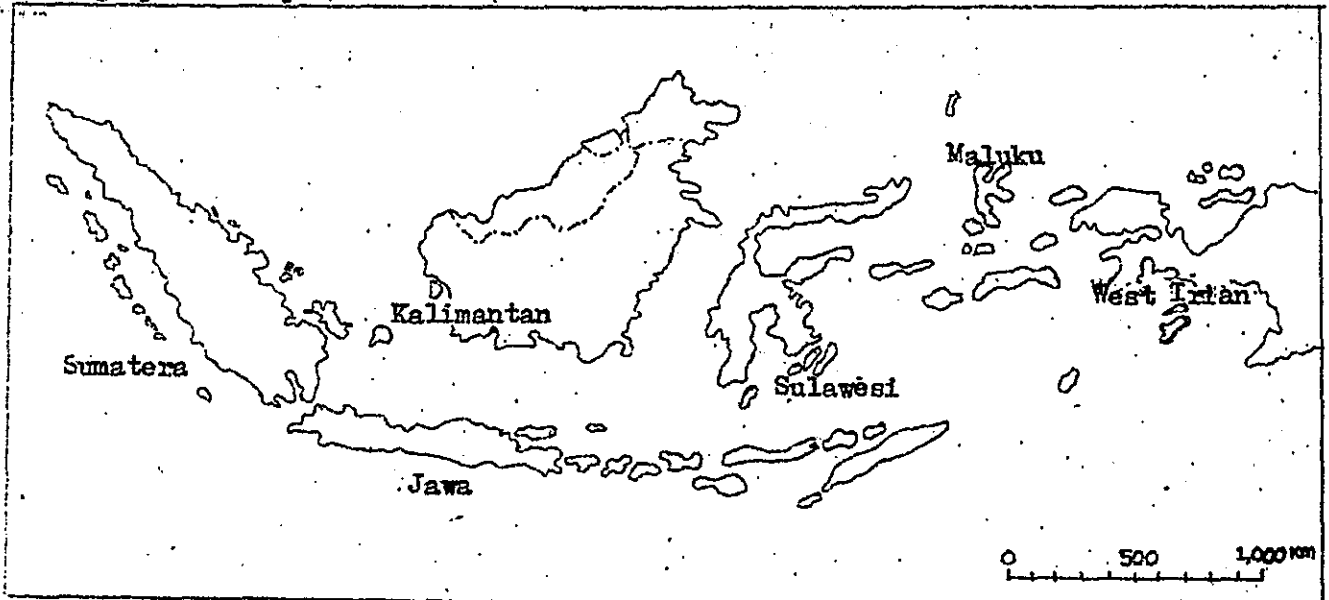
Source : Bulatin Indonesian Economic Survey, vol. XI.No.1, 1975-3.

Fig. 3.2. Map of Indonesia Expressed in terms of Economic Magnitude, 1972.-



- (Note)
1. The area of each island represents its Regional Gross Domestic Product in 1972, excluding oil sector.
  2. Prepared by the survey team on the basis of Table 1 - 22.

Geographical Map



3008. As the population of the Java Island is large, per capita RGDP is not so high with the index standing at 92 (national average-100). Per capita RGDP is the highest in Kalimantan with small population where the development of forestry resources has progressed steadily. It is 63,000 rupiahs (\$150) in Kalimantan, followed by Sumatera, Java and Sulawesi in that order. Per capita RGDP in Sulawesi is the lowest, representing only 9% of GNP. Per capita RGDP there is 25,000 rupiahs (\$60). These facts shows the regarded economy zone.

3009. The regional income research group also estimated the annual economic growth rate of each province of the 1968-1972 period. According to the estimate, the national average is 6.3% and the rate ranged from the highest 25.0% for East Kalimantan to the lowest minus 1.4% for North Sulawesi. The growth rates for provinces on the Sulawesi Island are below the national average, except for 8.3% for South-east Sulawesi Province: 3.5% for South Sulawesi Province and 5.9% for Central Sulawesi Province. When 27 provinces in Indonesia are classified into four groups according to economic growth and scale, South, North and Central Sulawesi provinces belong to a group with small economic scale and low economic growth. Economic growth rate for all the Sulawesi Island is 3% and that for Zone D is 5.1%

Table 3.3. Distribution of Regions by Per Capita RGDP and Annual Growth Rates.

	High Incomes	Low Incomes
High Growth	7 Regions: East Kalimantan, Riau, Jakarta, Irian Jaya, North Sumatera, Aceh, Maluku	3 Regions: Bali, West Sumatera, Southeast Sulawesi
	Share of Population : 15%	Share of population: 5%
	Share of GDP : 25%	Share of GDP : 4%
Low Growth	6 Regions: Central Kalimantan, Jambi, South Sumatera, South Kalimantan, Bengkulu, East Java.	10 Regions: Lampung, West Kalimantan, Central Sulawesi, South Sulawesi, West Java, Central Java, Yogyakarta, East and West Nusatenggara
	Share of population: 29%	Share of population: 51%
	Share of GDP : 31%	Share of GDP : 40%

Source: Buletin of Indonesian Economic Survey, vol. XI, No. 1, 1975-3

### 3.4. Industry

3010. Major industrial indicators are shown by main island and by regional in Table 3.4. The characteristics are pointed out as follows:

a) In 1972, 54% of Indonesia's rice production was made in Java. Sulawesi, which represent 7% of the national population, produced 7% of the country's total rice. Per capita rice production was 180 kg in Java, 278 kg in Sumatera, 246 kg in Kalimantan and 194 kg in Sulawesi. Therefore, that for Sulawesi is not so high.

3011. b) Meanwhile, Sulawesi brought about relatively high production in stock-raising and fishery. Forestry is overwhelmingly prosperous in Kalimantan, while that in Java and Sulawesi is not active.

3012. c) Seventy-three percent of newly established enterprises in 1971 and 85% of the total employees concentrated in Java. Sulawesi represented 5% for the number of new enterprises and 2% for the number of employees, which indicators that the scale of enterprises established there is extremely small generally as compared with that in Java. The number of employees per enterprise was 14 in Sulawesi against 51 in Java.

3013. d) The number of enterprises established in 1973 totaled 2,432 in South Sulawesi province, accounting for 8,5% the national total. The number of the employees in the province represented 2,3% the gross output 2.1% and the added value 1.9%. These facts shows the small scale of the enterprises in the province as a whole.

3014. e) It is said that as much as 95% of total tonnage of Indonesia's coastal shipping service is used in Java and the western region. The volume of cargo traded in East Indonesia (Zone D) represented only 3% for loading of the national total and 6% for unloading.

### 3.5. Social Overhead Capital

3015. The less advanced development in Outer Java has always been attributed to the delay in buildup on infrastructure. Two aspects can be pointed out in this problem. The first is the poor economic infrastructure. This leads to a situation that although natural resources exist, they cannot be transported and that the difficulty in securing electric power and water supply causes a slower pace of establishing enterprises. The second is the level of social infrastructure, including housing, hospitals and schools. As a result, there will be a situation that even if an agricultural development project is launched, farmers tend not to settle down in the region, and that a project to set up new

Table 3.4. Major industrial indicators by Region.

Indicator	Area of rice-field		Rice production		Number of lives-stock		Fish catch		Number of production		Number of employees		Newly Established Enterprises		Volume of Regional Trade		Foreign Capital Investments		
	1972	1971	1972	1971	1972	1971	1972	1971	1972	1971	1972	1971	1972	1971	1972	1971	1972	1971	1972
Unit	10 <sup>4</sup> ha	10 <sup>4</sup> t	10 <sup>4</sup> t	10 <sup>4</sup> t	10 <sup>4</sup>	10 <sup>4</sup>	10 <sup>4</sup> t	10 <sup>4</sup> t	10 <sup>3</sup>	10 <sup>3</sup>	10 <sup>3</sup>	10 <sup>3</sup>	10 <sup>3</sup>	10 <sup>4</sup> t	10 <sup>4</sup> t	10 <sup>4</sup> t	10 <sup>4</sup> t	10 <sup>4</sup> t	mil.
1. Java	433	1.364	1.254	26	55	16.035	823	290	109	1.721									
2. Sumatera	193	578	436	46	1.314	3.443	103	564	1.047	235									
3. Kalimantan	68	127	70	25	2.491	762	16	70	61	409									
4. Sulawesi	56	166	200	18	99	1.119	16	25	13	210									
5. Others	48	134	346	9	1.077	527	14	36	9	545									
Total	798	2.370	2.307	125	5.037	21.975	972	985	1.244	3.120									
1. Zone A	120	413	319	35	973	1.891	75	93	677	146									
2. Zone B	416	1.162	945	35	494	12.546	514	732	411	1.652									
3. Zone C	175	565	572	28	2.293	6.011	360	111	128	573									
4. Zone D	87	230	472	27	1.176	1.527	23	49	28	747									

Note: Prepared on the basis of various statistics.

enterprises is cancelled due to severe living conditions.

3016. Several indicators concerning infrastructure are shown in Table 3.5. When the fact that the area of the Sulawesi Island represents 10% of total national land area is taken into consideration, the road extension in this region is relatively long. Road length per square kilometer is 50 meters in Java, 60 meters in Sumatera, 10 meters in Kalimantan and 70 meters in Sulawesi.

3017. As for capita comparison of other indicators, the number of hospitals in Sulawesi is above the national average, the number of university students and the number of libraries are equal to the national average respectively, and the power consumption and the number of doctors are below the national average. The number of telephones across the nation totaled 220,000 in 1971, about 70% of which were installed on the Java Island. The number of telephones in Sulawesi stood at 11,500 accounting for 5% of the national total.

Table 3.5. Infrastructure-related Indicators by Region

	Road Extension	Power Consumption	Number of hos- pitals	Number of doc- tors	Number of Uni- versity students	Number of lib- raries
	1971 10 <sup>3</sup> km	1969 10 <sup>4</sup> MHW	1970	1970	1972 10 <sup>3</sup>	1972
1. Java	29	153	505	3,730	98	7,578
2. Sumatera	30	24	265	901	20	1,552
3. Kalimantan	6	4	70	127	4	396
4. Sulawesi	14	5	199	227	9	902
5. Others	10	2	125	173	5	263
National	89	188	1,164	5,158	136	11,940
1. Zone A	18	14	198	633	17	564
2. Zone B	32	125	478	3,068	81	7,427
3. Zone C	16	41	188	1,097	24	2,847
4. Zone D	23	88	300	360	14	1,102

Note: Prepared on the basis of various data.



4. Physical feature.

4.1. Introduction.

4001. Sulawesi island (formerly Celebes) is located approximately in the centre of Indonesia which spans a distance of about 5,000 km from east to west. The island is divided into four provinces. According to the 1971 Census, South Sulawesi Province has an area of 82,768 km<sup>2</sup> according to the Agraria Office, and accounts for 36% of total area of Indonesia. The province is separated by the Verboek mountains from Central Sulawesi to the north and faces the straits of Makassar, Flores Sea and Gulf of Bone. The equator crosses the narrowest part of Central Sulawesi and South Sulawesi Province extends from lat. 0.85°S to lat. 7°S. The 120th parallel of east longitude passes through the center of the province.

4002. The northern part of South Sulawesi Province embraces many 2,000-3,000 meter high mountains topped by Mt. Rantekombela (3,455 m). In the southern part run the Bone ridge and the Maros ridge (both being 800-1,000 meter high). But the rest of the southern part composes a fertile alluvial plain. The vast Tempe lowland in the central part which embraces Lake Tempe is one of Indonesia's biggest rice producing areas.

4003. With high temperature and frequent rainfalls, the province belongs to the tropical zone, and is sustainable to monsoons. Temperatures and the amount of rainfall differ from region to region, but generally the dry season lasts from June to October. The rainy season from December to March accounts for more than 70% of annual rainfalls. The rainfall in Ujung Pandang is compared with those in Jakarta and Surabaya.

4004. Temperatures are high throughout the year at 26.4°C on an average, 31.8°C at the highest (August through October) and 21.7°C at the lowest.

4005. Humidity is also high. The humidity of Ujung Pandang City is 70% on an average, more than 90% in December through February and about 50% in August through October.

4006. Ujung Pandang is visited alternatively by the 6-month easterly monsoon season and the month westerly monsoon season. The two seasons correspond to the dry and rainy seasons. During the dry season, easterly and southeasterly winds blowing from Australia

are dominant, while during the rainy season, westerly and northwesterly winds blowing from the Asian continent are dominant.

As a consequence, the dry and rainy seasons are reversed in the eastern and western part of South Sulawesi Province. The time lag in rice planting and harvesting in both parts of the province facilitates seasonal movement of farm lands.

4007. Although largely volcanic, the province suffers few natural calamities such as earthquakes, tidal waves or storms. During the rainy season, however, there are occasional damages from intensive heavy rains in some areas.

4.2. Climate

4.2.1. Rainfall

4008. A meteorological observation station in South Sulawesi Province has been established in 1930, and monthly rainfall data were published as official reports. At present the meteorological observation rainfall are carried out by more than 200 stations, controlled by several agencies such as the meteorological Agency, Agricultural Extension Service and DPUP, as shown in table 4.1.

Table 4.1. Number of observation stations in South Sulawesi  
(1976)

Operation System	Meteorological Agencies	Agril. Extension Service	D.P.U.	Total
Automatic	8	5	6	19
Ordinary	10	47	140	197
Total	18	52	146	216

Source: D.P.U. South Sulawesi Province.

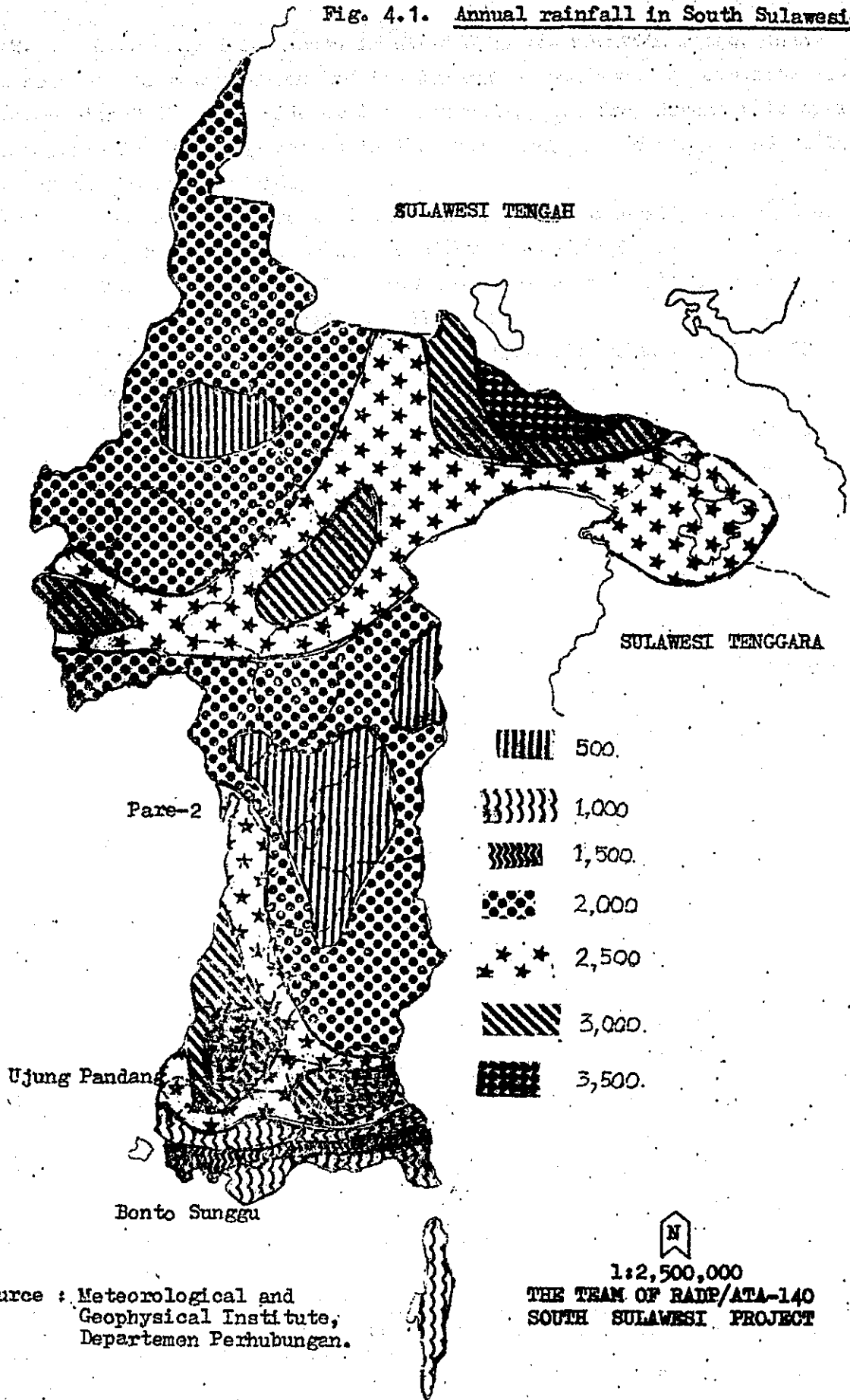
These observation data figured the monthly of precipitation and the number of rainfall days only.

4009. There are many usefull documents on the rainfall condition recorded by Institute of Meteorology and Geophysicst, Ministry of Commu-  
nication. In those documents, the map of annual rainfall distribution ( in millimeters) is shown on figured 4.1. (see next page).

4010. The characteristics of rainfall in South Sulawesi is not caused by cyclone or complicated rainy front, therefore the range of rainfall is not so extensive and the continous rainfall condition differs caused by effect of the geographycal features.

4011. In general, it is classified to two seasons, because the wind comes from east side or west side of Sulawesi Island, and it will be de-  
cided by the geographycal features such as mountainous area and the length of merine areas which supply water vapour. Certainly when the west wind begins to blow loaded with the water vapour of the Java sea, there are heavy rains on the east side of South Sulawesi.

Fig. 4.1. Annual rainfall in South Sulawesi.



4012. Generally the monsoon is divided by the mountain range, then the area of the rainy season and the dry season are shown as opposite direction either the west side or the east side, i.e. from November to April (next year) is the rainy season in the west side, on the other hand it is the dry season in east side.

4013. The amount of precipitation and rainfall intensity during the rainy season, is quite different caused by the geographical features, therefore the rainfall period and the amount of precipitation by each catchment area show the complicated difference.

4014. The rainfall conditions for each bloc (divided in Pelita II by BAPPEDA refer to the figure 4.1.) are as follows:

Bloc I: It is divided into the southern coastal area and the western coastal area, based on the total amount of annual rainfall. The southern coastal area is one of the driest area, having only 1,000 mm - 2,000 mm of the total amount of annual rainfall. On the other hand, in the western coastal area, it is counted about 2,000 mm - 3,000 mm expected.

Bloc II: This bloc consist of three kinds of area. Kabupaten Barru which include the western coastal area, where the total amount of annual precipitation is 2,500mm - 3,000 mm per year. The northwestern coastal area covers Kabupaten Pinrang and Kotamadya Pare-Pare, which has about 2,000 mm per year. The last one is located in the inland area, which has about 2,500 mm per year.

Bloc III: This bloc consists of the coastal area and the inland plain area surrounding Tempe Lake. The coastal area is one of the most scarce rainfall area not only the annual amount of precipitation but also duration of the rainy season. In this coastal area the total amount of annual rainfall is less than 1,500 mm per year, the paddy field are damaged by drought very often. The inland area developed centering around the Tempe Lake has the annual rainfall of 1,500 mm - 2,000 mm.

Bloc IV : Mainly it covers an area of matured forest and is under the condition of heavy annual rainfall which is estimated as more than 2,500 mm. Especially 4,000 mm of precipitation can be observed in the border area on other provinces. In the Southeast part comparatively smaller annual rainfall about 1,000 mm - 2,000 mm are observed.

Bloc V : This bloc located in the northwestern coastal area, the amount of annual rainfall of about 1,500 mm. But there is not so much difference concerning the monthly rainfall, between the rainy season and the dry season, that is water resources are available.

Table 4.2. Acreage of paddy field by annual rainfall condition and by bloc (1975)

Annual Rainfall Condition (m.m.)	Acreage of paddy field (ha.)					Total
	Boc I.	Bloc II.	Bloc III.	Bloc IV.	Bloc V.	
1,000 - 1,500	19,910 (14%)	39,579 (35%)	122,454 (75%)	6,820 (11%)	20,416 (89%)	209,179 (41%)
1,500 - 2,000	16,847 (12%)	73,743 (65%)	41,693 (25%)	4,540 (7%)	-	136,823 (27%)
2,000 - 2,500	14,894 (10%)	-	-	-	-	14,894 (3%)
2,500 - 3,000	48,563 (33%)	-	-	39,125 (62%)	2,425 (11%)	90,113 (18%)
3,000 - 3,500	41,087 (28%)	-	-	12,269 (20%)	-	53,356 (10%)
3,500 - 4,000	4,000 (3%)	-	-	-	-	4,000 (1%)
T o t a l :	145,301 (100%)	113,322 (100%)	164,147 (100%)	62,754 (100%)	28,841 (100%)	508, 65 (100%)

Source : Diperta Sulsel.-

4015. Table 4.2. shows that the paddy field area could be divided into two parts, one is the area in annual rainfall of 1,000-2,500 mm and the other is 2,500-3,500 mm. The acreage of paddy field in the area of 1,000-2,500 mm. rainfall is estimated as 346,000 ha. and is about 70% of the whole paddy field. This area mainly covers the area of alluvial soil, and is the suitable area for the improvement of paddy production. Therefore, the land improvement works such as the rehabilitation works of irrigation facilities, the efficiency of water management systems by the farmers themselves should be carried out. On the other hand, the rainfall area of 2,500-3,500 mm covers an area of 143,000 ha., and is about 30% of the total paddy field.

4016. The situation of each bloc are as follows:

Bloc I: This bloc is divided into two areas based on the annual rainfall, one is the area of 1,000-2,000 mm and the other is 2,500-3,500 mm. The former is located in the southern part of the coastal area, where it is necessary to carry out various improvement works. The latter is located in the western part of the coastal area and there are irrigation facilities which have been established already.

Bloc II: In this bloc, the amount of annual rainfall is more than 2,000 mm and is not considered to be enough for paddy cultivation. But in part of this bloc, the net work of irrigation facilities covered many paddy field which contribute to the increasing of production.

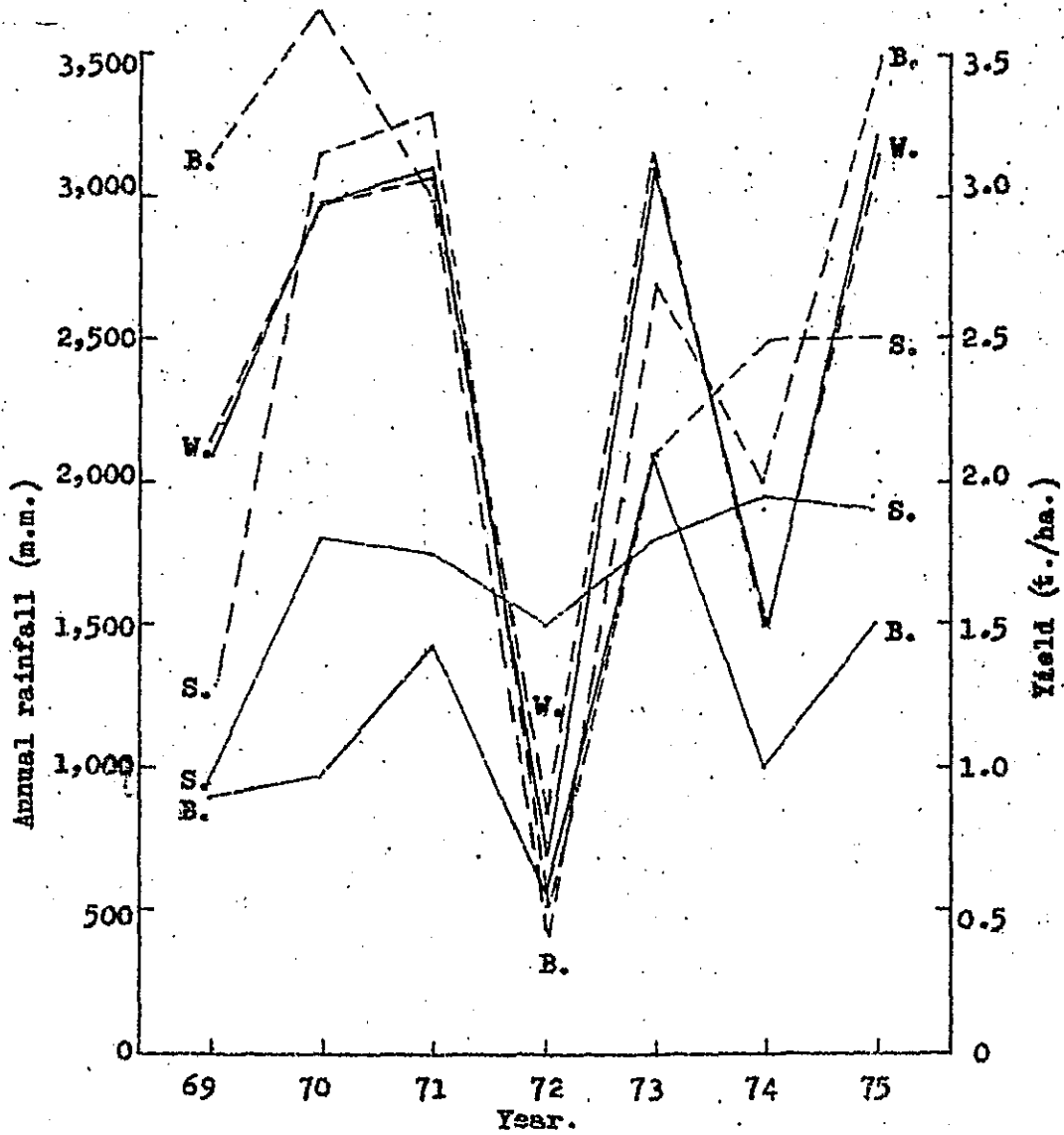
Bloc III: The amount of annual rainfall for this bloc is estimated more than 2,000 mm as same as bloc II. But in this bloc land improvement works are not yet carried out in almost of the area. Therefore, whenever the weather condition is not so suitable, the paddy production is damaged by drought in this bloc.

Bloc IV: According to the special feature of this bloc, an area of about 80% of the fields in this bloc is located in the area of 2,500-3,500 mm. of annual rainfall. But in the southeast coastal side as one of the main producing district or rice, the amount of annual rainfall is only 1,000-2,000 mm. Therefore, the improvement of irrigation facilities is urgently necessary for the area.

Bloc V: The almost all areas of this bloc are in the area of annual rainfall 1,000-2,00 mm. But the water utilization is not suitable, despite many forest reservation are located in the catchment area.

4017. Figure 4.2. shows the relativity of yield with the amount of annual rainfall. The most sensitively responded area for above mentioned factors, is the extensive region of rainfed. In case of Kabupaten Wajo, the rate of irrigation area is estimated at only 3%, including all irrigation systems, and had been damaged in the drought year in 1972 and 1974. On the other hand, in Kabupaten Bulukumba, many irrigation facilities have been established and the irrigable area covers about 93% of the whole paddy field.

Fig. 4.2. The Relativity of yield with annual rainfall.  
In Kabupaten Wajo, Bulukumba and Sidrap  
(1969 - 1976)



Note: 1) ——— : Rainfall.

2) - - - - : Yield.

W. = Wajo

B. = Bulukumba

S. = Sidrap



But the growing behaviour of paddy shows much cultivation in the drought year because they have not enough catchment area for water resources.

4018. Comparatively slight damage area could be found in the area with high irrigable rate which has forest in the hinterland. Naturally the improvement and management of irrigation facilities is one of the most effects in each bloc. The case of Kabupaten Sidrap about 72% of the whole paddy field is supplied by irrigation systems, therefore they have the stabilized production without connection with the rainfall conditions.

4019. Figure 4.3. shows the cultivation season for paddy field which is divided into two areas, the west part and the east part of South Sulawesi the rainfall condition for both areas are separated by the wind direction of each monsoon. On the east side area the wet season begins from April to September/October, while the other months belongs to the dry season. On the west side zone the wet seasons begins from October to March while the other months are include in the dry season.

#### 4.2.2. O t h e r s

4020. At present the observed records concerned are mainly the rainfall data, and the other observation has not been carried out just like the meteorological station in the area of the Hasanuddin Airport. Recently several station area established under the operation of DPUP of South Sulawesi. After few years, these observed records will be used as the basic data for various planning. A observed record at Ujung Pandang, is shown in figure 4.4.

4021. According to the observed record of Meteorological Station at Mandai, the annual average temperature is about  $27^{\circ}\text{C}$ , and the maximum temperatur is  $29-32^{\circ}\text{C}$ , on the other hand the minimum is observed  $22-23^{\circ}\text{C}$ .

In South Sulawesi, the condition of climate is observed comparatively high in temperature and humidity because the monsoon comes across the hot Java Sea. The humidity is observed about 70-80%. The most drought period comes out in October in the southern coastal area caused by the nonsoon from the southeast. Generally, the average wind velocity is not so strong, but the local wind, for example, the strong wind are quite frequent in Kabupaten Jeneponto.

4022. The annual sunshine duration is recorded about 2,850 hours at Ujung Pandang, and they have not so much sunshine hours during the rainy season, but in the dry season it is observed the opposite condition.

Fig. 4.3. Paddy cultivation by season in South Sulawesi Province

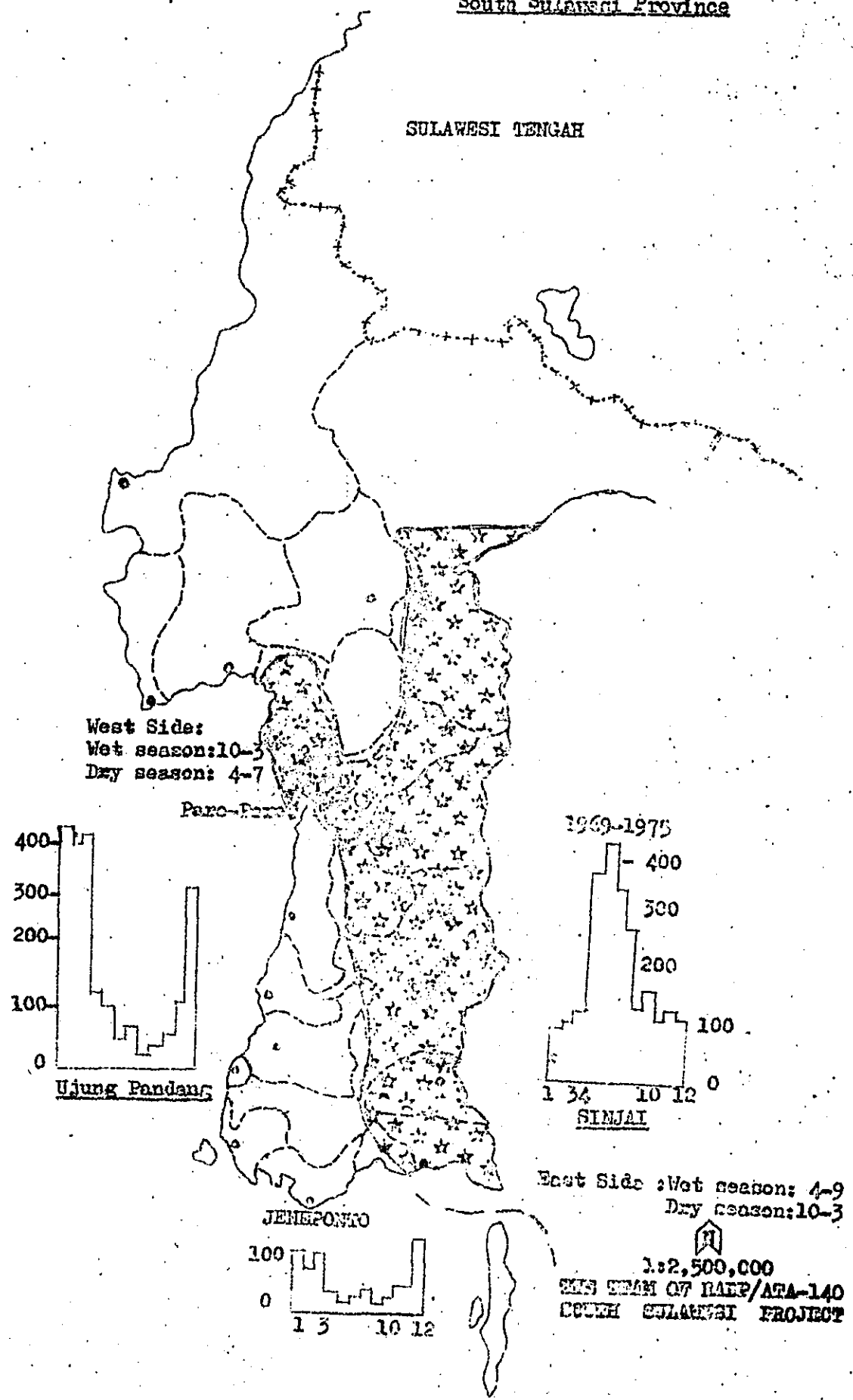
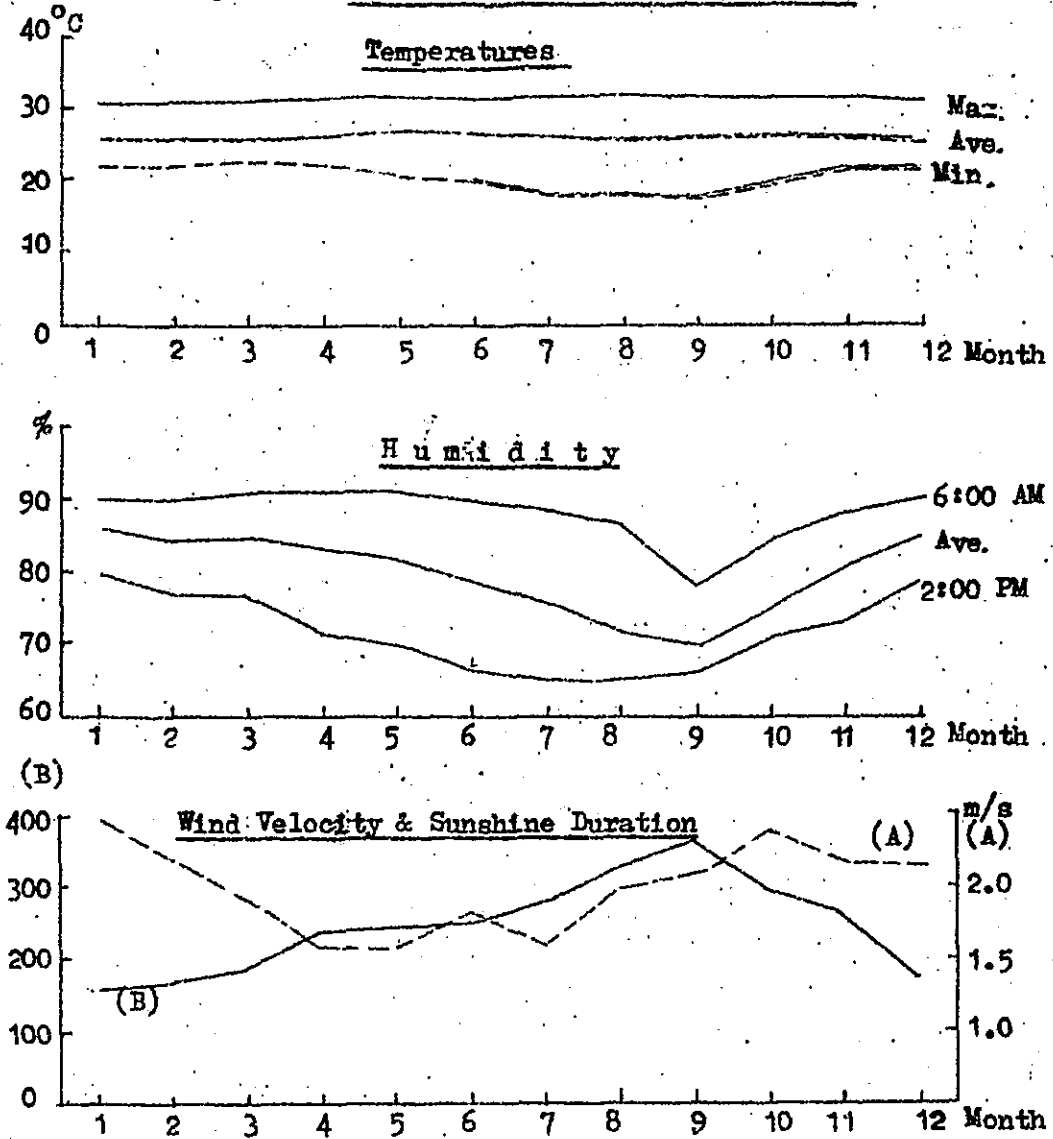


Fig. 4.4. Observed record at Ujung Pandang



Note : (A) Wind Velocity : m/sec.

(B) Sunshine Duration : Hour/Month

Source : Meteorological and Geophysical Institute  
Departemen Perhubungan.

According to the relation between weather condition and agricultural production it is not so much important subject, except the rainfall condition. Generally, the rice cultivation which is carried out at the high land with more than 500 meters above sea level, without any specific disposition of control by using pesticides. On the other hand, some upland crops are taking advantage of the climate condition, such as the vegetable farming and the coffee growing. In case of the vegetable cultivation especially the leaf vegetables, they get the effect of the climate condition that they need control against disease injury. Therefore, the main producing areas of cabbages or chinese cabbages are expanded because of the cool temperature by the high altitude of the mountainous areas, more than 500 meters above sea level, in Kabupaten Jeneponto, Gowa, Enrekang and Tator. There is a same tendency in coffee cultivation which is planted in the high elevation areas. Coffee arabica should be cultivated in area of 500-2,000 meters above sea level, the coffee robusta is planted less than 700 meters above sea level in the normal places.

The altitude of those area are shown on the contour map in Fig. 4.5.

#### 4.3. Geology, soil and topography.

##### 4.3.1. Geological condition

4023. The Sulawesi Island shows the complex of geological condition because it belongs to the same volcanos chain of the Philippines. In the northern part of South Sulawesi, the volcanic activities had been done there and volcanic soil is discovered in some fertile soil area of agricultural production. And the area is covered by mountainous area with forest productions. The parent rock of southern coastal mountain ranges is mainly one kind of volcanic rock, contained many quantities of potassium. The plain area are extended such as the island basin, like Kabupaten Bone in the southeast part of the Province. The soil fertility is less than that of Java island.

4024. Latimojong mountain range is located in the central part of the Province, which is covered by many eruptive rocks to the acidic rock. The Mount Lompobattang is an extinct volcano located in the corner of southern part, and this parent rock is the basicity andesite or basalt. The Quarternary stratum covers catchment area for Tempe Lake and

Fig. 4.5. Contour Map of South Sulawesi

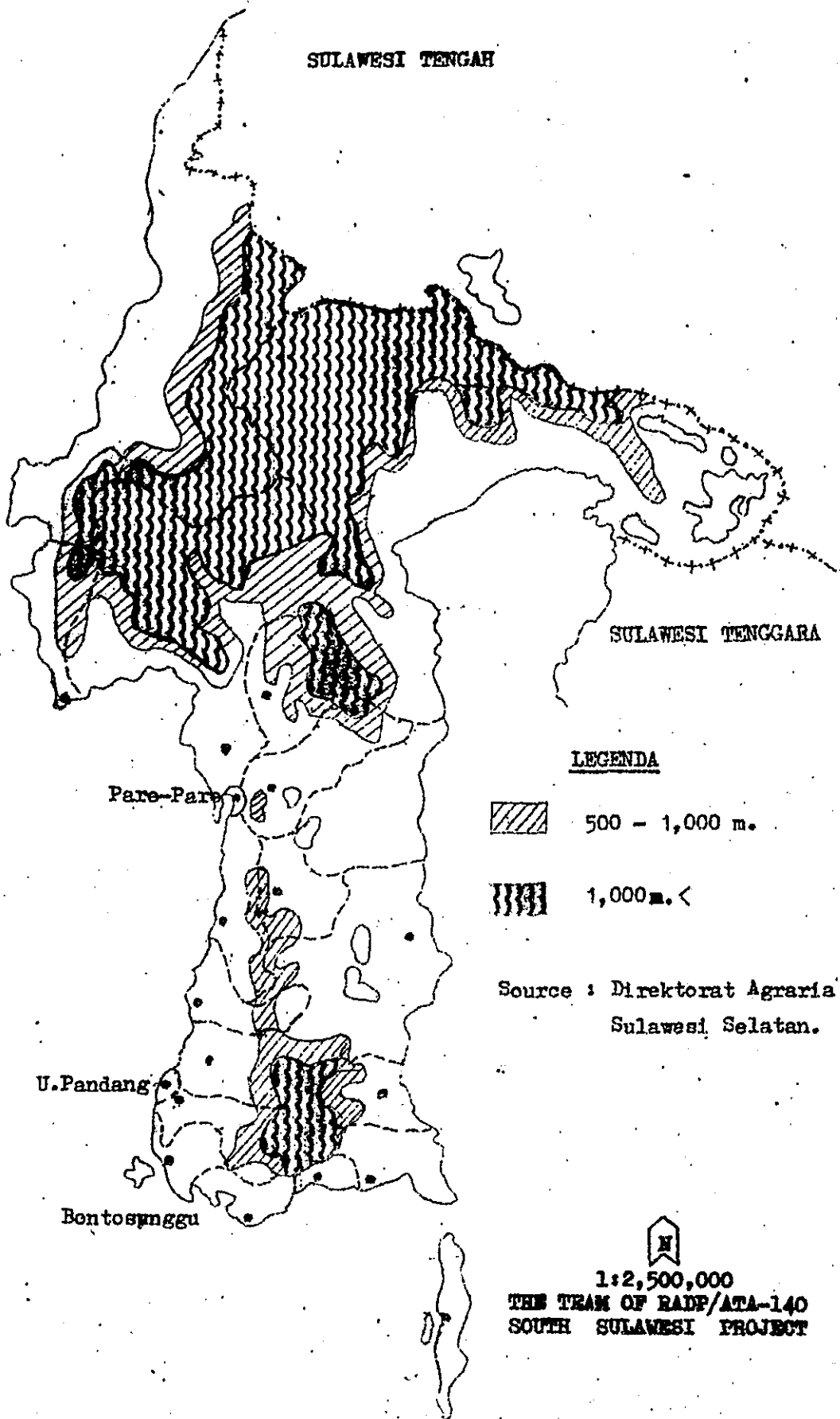
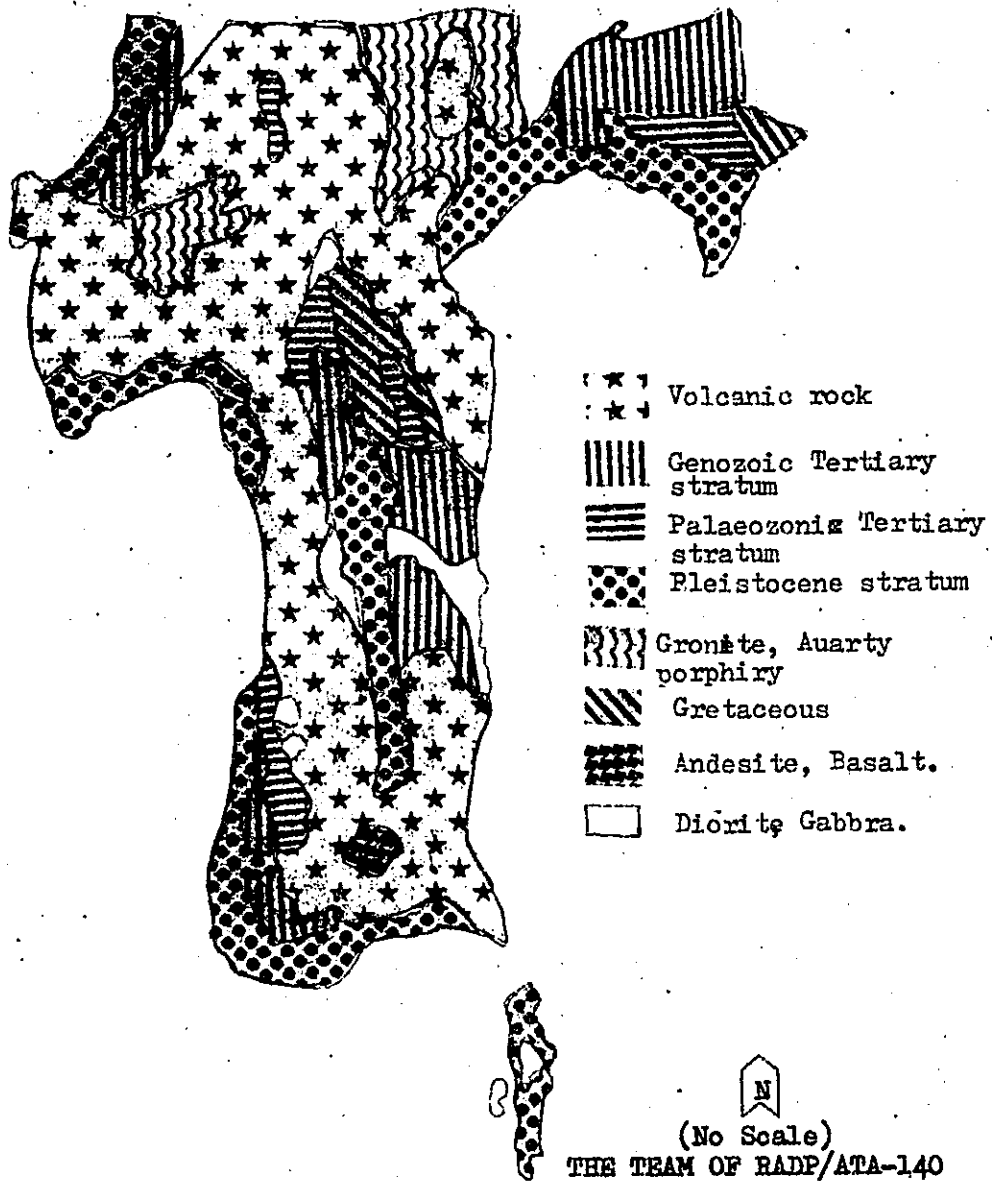


Fig. 4.6. Geological Condition in South Sulawesi



Sidenreng Lake and along side the coastal line.

4025. The outside of the Quarternary stratum, especially the eastern side and inland area, are covered by the Tertiary stratum. The mesozoic cretaceous are discovered in the eastern side of Maros, the north-east of Tempe Lake and others. On the other hand the cristalline schist, the granite and others are dotted in various parts. The coral reefs are shown on coastal side.

4026. The geological land condition in South Sulawesi is expected to be normal in comparison with the other areas, because there are no new effluences from volcanoes and the weathering of Quarternary stratum is not so active.

#### 4.3.2. Soil condition

4027. The northern part and the southern part of the Province are covered by the mountain areas, on the other hand Pinrang, Tempe and Bone plains are spreaded from the northwest side to the southeast side. In the central part, there are two lakes which is called the Tempe and the Sidenreng. Another vast plain is discovered in Kabupaten Iauwu along the coast of the Bay of Bone.

4028. According to the soil condition of the plains mentioned above, the alluvial soil spreads and discovered like gley soil on the part of plains area. The most part of these area are used as paddy field. The volcanic rock and aquaous rock are in the mountain area of the northern part, and consist of podsollic soil with some mediteran soil. In the area mentioned above, the shifting cultivation area carried out at present and some barren soil are discovered in those areas. The mountain area of the southern part area covered with volcanic rock and the soil condition of high elevation area is shown the andosol. In the hill side of the lowland, the soil condition namely latosol and grumusol is distributed on the coastal area. The mediteran soil covers the foot of the mountains.

4029. In the central hill and side, the aquaous rock could be seen along the plains, outsides of those area along the western coastal area are covered by the volcanic rock. Therefore, the soil condition is the podsollic in the northern part of the central lowland, and the mediteran soil is seen on the southern part.

4030. The phenomenon of leaching is discovered only a few parts and is only a very little amount, but comparatively the soil condition will

be suitable for farming. There is problems for the possibility of development because of the alkali soil except the area of grumusol or latosol on southern part.

#### 4.3.3. Topography.

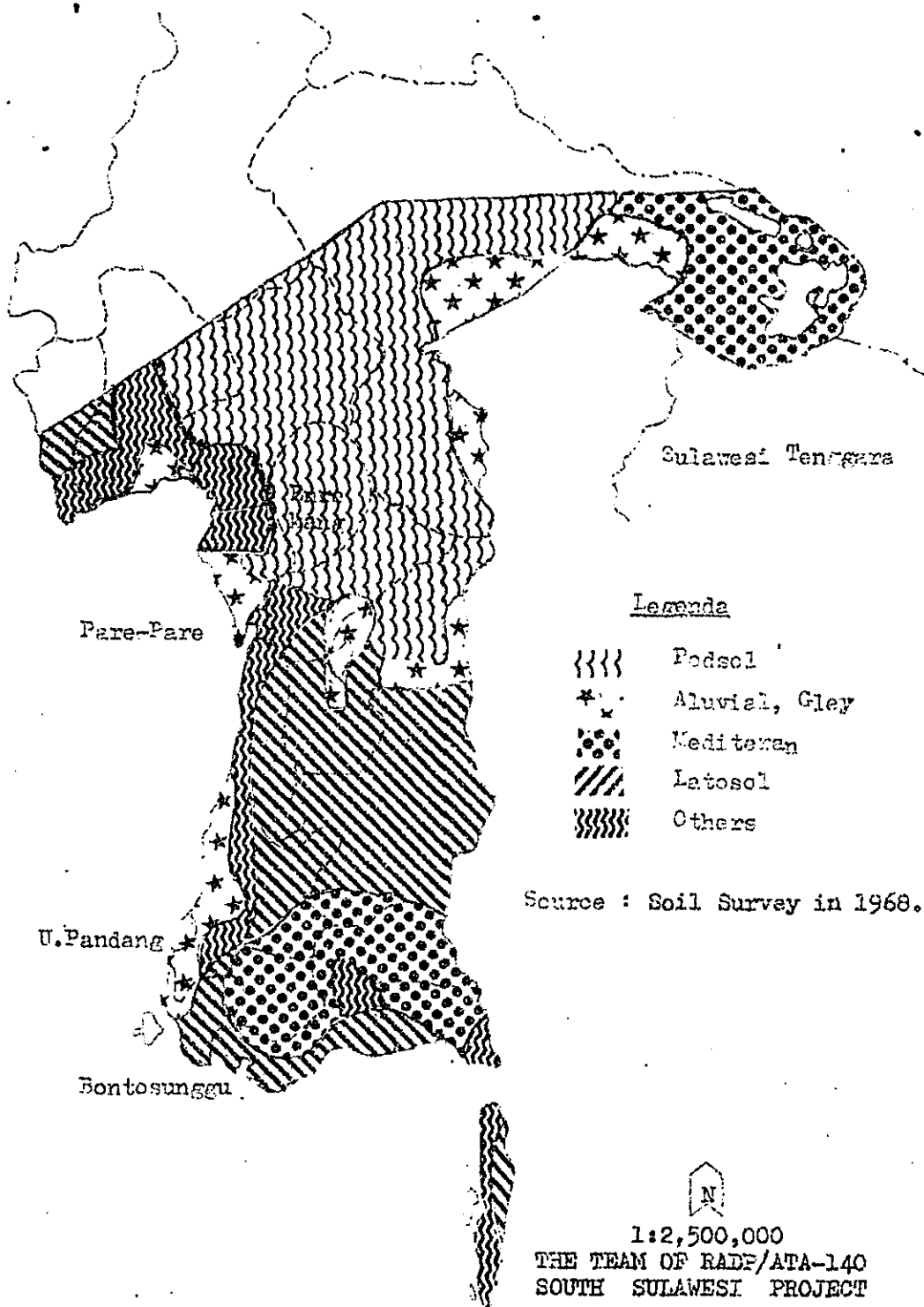
4031. In South Sulawesi, many mountain ranges are found from north to south. The Mount Waoekara 3,127 m, Kasintunu 2,855 m, Kanboeno 2,950m and other mountains are predominant including the Molengraaf ranges in the northern part of the Province. The Quarles ranges are rising on the western part of Molengraaf ranges and is covered with the tableland of volcanic tuff. The Saddang River, one of the most important river for irrigation, is flowing out from the Quarles or the Latimojong ranges. The Pennema ranges in the eastern part of the Molengraag ranges, included the Mount Sidole 2,199 m, and Nokilalaki 3,311 m, in the topographical condition of a tableland of more than 1,500 m above the sea level. In the direction from north to south, the Latimojong ranges shows the Mount Lompobattang 2,871 m. in the southern part of the Province.

4032. The Tempe and Sidenreng Lakes are following into the Walanae River, and both lakes are located on the central inland basin. In South Sulawesi, there are vast mountain areas, so that the flats are not enough. Usually, the drift soil and sand of rivers are not so much and the slope of river bed shows a high angle, therefore water resources can be used from those rivers without improved irrigation facilities. Since the forests do not cover so much in the mountain areas, adequate forest improvements such as the forest conversation works to prevent and others are necessary. The length of Saddang River is 175 km. and the Karame River is 195 km.

4033. In this Province, those are four main lakes, i.e. Towuti 578 Km<sup>2</sup>, Matana 156 Km<sup>2</sup>, Tempe 46 Km<sup>2</sup> and Sidenreng 31 Km<sup>2</sup>. The Tempe Lake units with the Sidenreng Lake during the wet season.



Fig. 4.7. Soil Condition in South Sulawesi



4.4. Water Resources and drainage.

4.4.1. Estimation of the total amount of the water.

4034. An integrated utilization of the observation system is one of the most important basic factor for development of the water resources. The Agricultural Extension Service, the D.P.U.P. of South Sulawesi and other agencies concerned have several observation facilities respectively. For instance, some agro-meteorological observatories, are now beginning to serve under the control of the Extension Service, and beside then the DPUP of South Sulawesi have established a few all-round observatories, which used some equipments, such as the maximum & minimum thermometers, the wind vane & anemometers, the sunshine recorders, the hydrometers, the evaporation pans, the automatic rain gauges and so on.

4035. The analysis of run-off of catchment area is most urgently necessary. The observatories have been established with the automatic type in some station. In addition, the 23 investigation check points were established with the automatic water level indicator for observation of water level on principal rivers. While those recorded data have been collected by DPUP South Sulawesi. After several years, those data will be used for hydrological analysis not only to steady the present condition but also for investigation of development planning.

4036. It is difficult to analyze the discharge of because of shortage of the recording data at present, however, the estimation method by specific discharge will be suitable for the present condition. Naturally the estimated specific discharge is not always accurate because the basic data have not enough authenticity at present. The following specific discharge was analyzed by the short term Expert Mr. R. Tatsumi in connection with the river natural which current which from about 100-300 km<sup>2</sup> of the catchement area. The available amount of water use will be able to be estimated through the following table:

Table 4.3. Specific discharge in South Sulawesi

Item	Long term of rainy season (Kab. Luwu)	Unit: m <sup>3</sup> /Sec/Km <sup>2</sup> .	
		Short term of rainy season (Kab. Jeneponto)	
Rainy season's one	0.10 - 0.15	0.15 - 0.25	
Dry season's one	0.025 - 0.035	0.010 - 0.015	

Source: D.P.U.P. Sulsel.

4.4.2. Irrigation system and areas.

4037. The irrigation systems are divided into three classes; i.e. the technical irrigation system, the semi technical irrigation system and the Desa/villago irrigation system. Each irrigation system may changing into the upper class, after carrying out some needed improvement works. The present situation of irrigation system are shown in the table 4.4.

Table 4.4.: Irrigation System in South Sulawesi 1976.

Unit: 1,000 ha.

Bloc	P l a n				Potentiality		
	(1)	(2)	(3)	Total	(1)	(2)	Total
I	52.768	39.591	69.813	162.392	42.392	29.265	71.657
II	74.537	5.024	11.437	91.018	61.537	5.024	66.561
III	16.900	21.502	23.703	62.105	13.978	16.227	30.205
IV	-	65.565	26.261	91.826	-	26.672	26.672
V	9.000	3.728	12.455	25.183	9.000	3.728	12.728
Total:	153.205	135.410	143.689	432.304	126.907	80.916	207.823

Note: (1) : Technical irrigation systems.

(2) : Semi-technical irrigation system

(3) : Desa-irrigation system.

Source : D.P.U.P. South Sulawesi.

4038. The situation of irrigated paddy fields are made clear by Agricultural Extension Service dividing each irrigation system and rainfed by bloc (refer to table 4.5.).

Table 4.5. Situation of Paddy Field in South Sulawesi (1975)

Unit: 1,000 ha

Bloc	Irrigated area				Rain fed (4)	Total
	(1)	(2)	(3)	+2+3		
I	16.302 11.2%	10.529 7.2%	40.237 27.7%	67.068 46.1%	78.239 53.9%	145.307 100%
II	49.002 43.2%	12.330 10.9%	14.611 12.9%	75.943 67.0%	37.458 33.0%	113.401 100%
III	6.880 4.2%	5.705 3.5%	19.070 11.6%	31.655 19.3%	132.892 80.7%	164.147 100%
IV.	1.305 2.1%	1.565 2.5%	37.782 59.8%	40.652 64.4%	22.468 35.0%	63.120 100%
V.	5.700 25.0%	2.377 10.4%	4.241 18.60	12.318 54.0%	10.523 46.0%	22.841 100%
Total	79.189 15.6%	32.506 6.4%	115.941 22.8%	227.636 44.8%	281.180 55.2%	508.816 100%

Note: (1) Technical irrigation systems.

(2) Semi-technical irrigation systems.

(3) Desa irrigation systems.

Source: DPUP, Sulsel.

(4) Rainfed.

4039.

Bloc I The irrigable area is estimated at about 46% of the whole paddy fields, which means very important as the main production area of paddy. In the western coastal area, the irrigation farming were expanded by the irrigation facilities and the situation of the rice production have been established steadily. On the other hand, in the southern coastal area, the amount of rainfall is not so much and the acreage of catchment area have not a wide range. Consequently the land improvement is necessary for both area.

Bloc II This bloc has given comparatively a normal rainfall condition, and is mainly paddy production area in Province. The irrigation facilities have been constructed and the irrigated area are estimated as about 67% of the whole area of paddy field. In addition the systematic techniques of five crops per two year begin to extend in this bloc, the most basic reason expected to have been done the development of irrigation farming with suitable facilities. If it is possible to invest on land improvement works, construction of branch canals, farm roads and land consolidation are necessary.

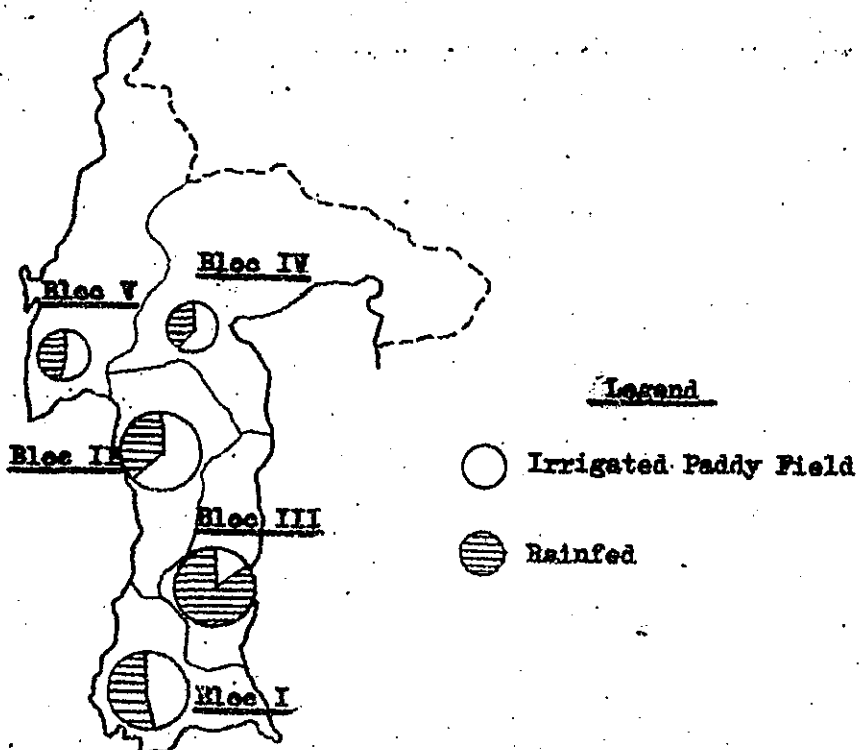
Bloc III The rate of irrigable area has shown the lowest, but this bloc has the most large acreage of paddy fields in South Sulawesi Province. Therefore, the total amount of paddy production, fluctuate because of drought damage caused by shortage of rainfall. At present the survey of Central South Sulawesi Water Resources Development Project has been carried out aiming the effect for the stability of production.

Bloc IV This bloc is located in the northeast part of the Province, where are enough acreage of suitable area for irrigable area. At present the Luwu Project have been carried out by the cooperation of foreign country, it will have a good effect to expand the acreage

for settlements. In the southern part of this bloc, the rate of irrigable area shows no small percentage because this part including the main production area for paddy, has brought the many efforts for land improvement.

Bloc V: There is enough catchment area compared with others, and the irrigable area is estimated for more than 50 % of all paddy fields. Truly, the many irrigation facilities has been constructed and on practical use according the profitable geographical features.

Fig. 4.8. Condition of irrigated area by Bloc in South Sulawesi Province



4.4.3. Availability of agricultural water

4040. The characteristics of rainfall condition in South Sulawesi is analyzed as follows:

- 1) The beginning period of the wet season is changeable every year,
- 2) the term of the wet season is fluctuating,
- 3) the duration of drought always happened during the wet season, and
- 4) the annual amount of precipitation is usually having a differences.

4041. The rainfall condition mentioned above cause the fluctuation of paddy production because of the damage by drought. The water supply for the paddy field is one of the most important factors for success of the development of agriculture in South Sulawesi. In other words the water supply and expanding of irrigation area are necessary to improve the paddy cultivation in the rainy season, which covered the majority of all paddy fields. In the dry season, availability of water resources is prerequisite for paddy cultivation.

4042. The effective way for water supply will described as the following ideas:

- 1) The control of main rivers flow; it is necessary to make effective use the invalid discharge, because there are a lot of annual rainfall and flow of main rivers. The construction of dams are the most fundamental ideas which could keep enough reserved capacity for water supply. But this idea is still premature in the Province because the basic hydrolycal data is not enough at present.
- 2) The improvement of main works; it is better to increase the effective of water by this idea, because the surface water must be used effectively. For instance, the construction of diversion weir is one of the most important way for prevention of invalid discharge.
- 3) The rehabilitation for existing facilities; most irrigation facilities had been constructed in the Dutch regime. Some of them are not keeping the good condition for water supply, because of landslide on depression. Especially the improvement of canal is one of the most effective measures, and if possible it is desirable to carry out the rehabilitation for the main works. As a

result, the various kinds of conveyance loss will be decreased and the irrigable area will be expanded. In case of Desa irrigation system, the rehabilitation works are expected to carry out by DPUP of South Sulawesi, like the "Sederhana Project" and others.

4) The water management; the water management is very significance for effective use of supplied irrigation water. At present, the effective use of river discharge is one of the general way to maintain the water supply, therefore the construction of simple main works will be necessary.

4043. On the other hand it is important to cut the water losses in the driving channel, which is estimated as follows:

Water loss in main canal:	5 - 7 %
Water loss in secondary canal:	7 - 12 %
Water loss in tertiary canal: (for the system of repeating use of water)	10 - 11 %
Total:	about 22 - 30 %

The unit duty of water estimated by DPUP of South Sulawesi is used for project finding. This data are classified with the scale of irrigable area, and it shows as follows:

Scale of irrigable area	Unit duty of water
200 ha.	1.5 e/ha./sec.
200 - 300 ha.	1.4 e/ha./sec.
300 - 500 ha.	1.3 e/ha./sec.
500 ha.	1.2 e/ha./sec.

4044. The improvement of irrigation facilities and water management is most important way to stabilize the irrigable area, and it will be available to be done by the farmers themselves.

4.4.4. Drainage

4045. The drainage in cultivated land is important as same as irrigation, because it is able to keep suitable soil moisture for crops. Mainly the drainage are carried out to help the suitable condition such as the surface water, ground water and soil water. In other words, it would not be able to separate the irrigation and drainage, however the drainage systems are not enough at present in South Sulawesi. Because of the supply of water under the gravity from plot to plot on some irrigation systems, in which water run out over the border, could be used for repeating irrigation system in the land area.

4046. In case of extensive cultivation by using local varieties, there is not so much experienced damage under the drainage systems. This reason is why the development of drainage facilities are negative in comparison with irrigation. But drainage is necessary for the cultivation of new high yielding varieties with improved techniques. The lowland area of around Tempe Lake have been damage quite frequently by the inundation and the flood. In this case the normal growing are disturbed and can not be expected good production of paddy. On the other hand at some part of alluvium area, the glei horizon has been discovered under the top soil, thus the growing of rootlet is not enough.



4047. Those phenomena mentioned above are necessity of the improvement of the drainage system for agricultural development. It is not so easy to carry out this aspect at present however the drainage development also should taken into consideration as a series of the development of water utilization.

4.5. Availabilities of land use and land utilization in the future.

4.5.1. Present condition of land use.

4048. The estimation of present condition of the land use is one of the most important aspects for the regional agricultural planning. The following items are estimated based on the statistical data by each agencies concerned. The estimated total acreage of the land use is about 6,293,000 ha. and the forest area covers more than 50% and cultivated area by farming activities is about 30% more of the total acreage.

Table 4.6. Present condition of land use in South Sulawesi (1976)

Items	Average (ha.)	Percentage (%)	Authorized By:
Shifting cultivation area	258,000	4.1	Extension Serv.
Forest area	3,222,000	51.2	Forestry Serv.
Grassland	590,000	9.4	Animal Husbandry
Estate crops area	324,000	5.1	Agrarian Serv.
Rice field area	509,000	8.1	Extension Serv./ Agrarian Serv.
Swamp forest area	50,000	0.8	Forestry Serv.
Fish pond area	46,000	0.7	Fishery Serv.
Salt farm area	2,000	0.0	Fishery Serv.
Remaining area	707,000	11.3	Agrarian Serv.
Total:	6,293,000	100.0	Agrarian Serv./ Bappeda.

4049. The present land use for each bloc are estimated as in table 4.7. and the condition of each bloc as follows:

Bloc I. There are many lands for cultivation of estate crops, upland crops and paddy. The shifting cultivation areas are the highest but there are only quite small acreage of the forest areas in this bloc.

Bloc II. There are many paddy fields in the coastal side and it is the most important rice production area. On the other hand, vast land is located in the central part of this bloc.

Bloc III. In this bloc, the widest land is the paddy field, but irrigable areas are limited. In the inland area of this bloc, the vast grassland is seen.

Bloc IV. This bloc is widest bloc among the five bloc, and about 70% of the covers with forest areas. The cultivated land is scarcely limited, but the availability of the water resources development is very big.

Bloc V. Almost of the northern part of this bloc covers with forest area which has the possibilities for development. And the other part of this bloc, vast grassland are found.

Table 4.7. Present condition of land use in South Sulawesi (1976)

Block	Unit: 1,000 ha. and %					Total
	I	II	III	IV	V	
1. Shifting cultivation area	112,488 (11.4)	39,718 (4.9)	39,968 (4.1)	27,539 (1.6)	38,055 (2.7)	257,768 (4.1)
2. Forest area	264,380 (26.6)	288,800 (35.8)	259,209 (26.9)	1491,722 (69.7)	918,000 (66.0)	322,111 (51.2)
3. Grassland area	70,452 (7.1)	104,876 (13.0)	182,247 (18.9)	79,088 (3.7)	153,337 (11.0)	590,000 (9.6)
4. Estate crops area	99,821 (10.1)	35,455 (4.4)	65,801 (6.8)	65,915 (3.1)	57,447 (4.1)	324,439 (5.1)
5. Upland	190,716 (19.2)	81,968 (10.2)	129,249 (13.4)	120,236 (3.6)	62,539 (4.5)	584,700 (9.3)
6. Low land/savah	145,310 (14.7)	113,402 (14.1)	164,147 (17.0)	63,119 (3.0)	22,841 (1.6)	508,819 (8.1)
7. Swamp forest area	2,520 (0.3)	2,254 (0.3)	29,068 (3.0)	10,807 (0.5)	5,351 (0.4)	50,000 (0.8)
8. Fish pond area	19,614 (2.0)	8,595 (1.1)	11,486 (1.2)	3,128 (0.1)	3,531 (0.3)	46,354 (0.7)
9. Salt farm area	2,000 (0.2)	-	-	-	-	2,000 (0.0)
10. Remaining area	83,734 (8.4)	130,846 (16.2)	83,906 (8.7)	277,150 (13.0)	131,160 (9.4)	706,796 (11.3)
<b>Total:</b>	<b>991,035 (100)</b>	<b>805,914 (100)</b>	<b>965,081 (100)</b>	<b>2138,704 (100)</b>	<b>1392,261 (100)</b>	<b>6292,995 (100)</b>

Source: Estimated by the team.

Table 4.8. Estimation of land use by Kabupaten in South Sulawesi Province

Unit : 1,000 ha.					
No.	Kabupaten	Shifting cultivation	Forest	Grassland	Estates crops
<u>Bloc I</u>					
13.	U. Pandang				180
14.	Maros	8,513	24,523	1,559	7,383
15.	Pangkep	3,652	17,450	1,797	5,245
12.	Gowa	14,438	70,323	12,847	23,001
11.	Talcahar	1,864	17,449	14,107	3,155
10.	Jeneponto	425	15,916	21,107	4,426
09.	Bantaeng		8,535	1,572	7,553
07.	Bulukumba	43,574	67,291	1,438	26,247
08.	Selayar	19,084	18,000	3,390	13,573
06.	Sinjai	20,938	22,938	12,655	9,058
	<u>Total</u>	<u>112,488</u>	<u>264,380</u>	<u>70,452</u>	<u>99,821</u>
<u>Bloc II</u>					
16.	Barra	6,561	89,385		4,006
17.	Pare-Pare		4,300		971
20.	Pinrang	5,694	63,640	19,978	10,153
18.	Sidrap	13,469	71,145	50,622	13,944
19.	Enrekang	13,994	60,130	34,276	6,381
	<u>Total</u>	<u>39,718</u>	<u>288,800</u>	<u>104,876</u>	<u>35,455</u>
<u>Bloc III</u>					
05.	Bone	36,286	162,995	95,522	34,394
04.	Wajo	3,682	47,214	80,473	16,712
03.	Soppeng		47,000	6,252	14,695
	<u>Total</u>	<u>39,968</u>	<u>259,209</u>	<u>182,247</u>	<u>65,801</u>
<u>Bloc IV</u>					
02.	Tana Tor	9,934	154,595	48,545	5,801
01.	Luwu	17,605	1,337,127	30,543	60,114
	<u>Total</u>	<u>27,537</u>	<u>1,491,722</u>	<u>79,088</u>	<u>65,915</u>
<u>Bloc V</u>					
21.	Polmas	29,605	248,000	40,072	19,068
22.	Majene	2,636	70,000	58,883	7,183
23.	Mamuju	5,814	600,000	46,382	31,196
	<u>Total</u>	<u>38,055</u>	<u>918,000</u>	<u>153,337</u>	<u>59,447</u>
	<u>G. Total</u>	<u>257,468</u>	<u>3,222,111</u>	<u>590,000</u>	<u>324,439</u>

(Continue)

Table 4.8. Estimation of land use by Kabupaten in South Sulawesi Province (continued)

No.	Unit : ha.						Total
	Upland	Paddy Field	Marsh	Fresh pond	Brackish w. pond	others	
<u>Bloc I</u>							
13.	1,111	3,956	99	1,479	-	4,742	11,587
14.	16,170	21,699	76	4,356	-	5,609	89,893
15.	14,591	20,873	200	5,228	600	11,852	81,488
12.	46,565	30,223	220	235	-	13,910	211,762
11.	9,208	16,123	468	2,025	400	4,274	71,073
10.	26,527	13,743	163	1,861	1,000	12,770	97,938
09.	18,050	5,015	-	77	-	3,297	44,099
07.	46,131	22,371	355	3,782	-	15,398	226,537
08.	1,146	799	875	58	-	1,286	63,191
06.	11,217	10,508	64	493	-	5,596	93,467
<u>T.</u>	<u>190,716</u>	<u>145,310</u>	<u>2,520</u>	<u>19,614</u>	<u>5,000</u>	<u>83,734</u>	<u>791,035</u>
<u>Bloc II</u>							
16.	7,469	11,482	374	1,964	-	22,320	143,761
17.	1,527	879	89	33	-	3,278	11,077
20.	49,572	46,715	1,587	6,479	-	33,287	237,305
18.	12,528	45,126	204	37	-	35,942	243,017
19.	10,872	9,000	-	82	-	36,019	170,754
<u>T.</u>	<u>81,968</u>	<u>113,402</u>	<u>2,259</u>	<u>8,595</u>	<u>-</u>	<u>130,846</u>	<u>805,914</u>
<u>Bloc III</u>							
05.	46,085	74,166	7,932	4,885	-	50,497	512,762
04.	48,148	68,288	21,136	6,585	-	18,599	310,837
03.	35,016	21,693	-	16	-	14,810	141,482
<u>T.</u>	<u>129,249</u>	<u>164,147</u>	<u>29,068</u>	<u>11,486</u>	<u>-</u>	<u>83,906</u>	<u>965,081</u>
<u>Bloc IV</u>							
02.	91,429	17,801	-	36	-	176,769	504,910
01.	28,807	45,318	10,807	3,092	-	100,381	1,633,794
<u>T.</u>	<u>120,236</u>	<u>63,119</u>	<u>10,807</u>	<u>3,128</u>	<u>-</u>	<u>277,150</u>	<u>2,138,704</u>
<u>Bloc V</u>							
21.	37,559	20,225	1,175	2,820	-	77,253	483,777
22.	12,654	1,135	147	646	-	9,904	163,188
23.	12,326	1,481	4,029	65	-	44,003	745,296
<u>T.</u>	<u>62,539</u>	<u>22,891</u>	<u>5,351</u>	<u>3,531</u>	<u>-</u>	<u>131,160</u>	<u>1,392,261</u>
<u>G.T.</u>	<u>584,708</u>	<u>508,319</u>	<u>50,000</u>	<u>46,354</u>	<u>2,000</u>	<u>766,796</u>	<u>6,292,995</u>

Source: Agrarian Service, Sulsel and other agencies concerned.

## 5. Socio-economic Condition in South Sulawesi

### 5.1. Population

5001. Indonesia is composed of 26 provinces. South Sulawesi Province has two cities (kotamadya) and 21 kabupatens, the largest number among outer provinces.

The fact that South Sulawesi Province has so many kabupatens shows how its population is large and how it is distributed over a wide area.

A kabupaten is composed of kecamatans (a kecamatan is as large as a few cities and villages put together). A rural kecamatan is composed of six to seven desas.

At present South Sulawesi Province has 169 kecamatan and 1,165 desas.

5002. According to 1971 Census. South Sulawesi Province has a population of 5.19 million, or 4.4 % of Indonesia's total population. Since the province accounts for 4.2 % of the country's total area, its population density of 62 persons/km<sup>2</sup> is slightly above the national average.

The province's population is characterized by the following three points:

1) Increase rate is low.

5003. Fig. 5.1. shows the change in South Sulawesi Province's population, based on censuses conducted in 1930, 1961 and 1976 in comparison with those of national total and of Sulawesi island. During the 10 years from 1971 to 1976, South Sulawesi population increased at an annual rate of 1.6 % compared with the national average of more than 2%. (Refer to table 5.1.)

2) Dependent burden is high.

5004. Fig. 5.2. shows the population compositions of the national total and South Sulawesi Province by age group. Higher percentages of children under 9 indicate the rapid growth of population in recent years. Children's percentages in South Sulawesi Province are higher than the national average.

The dependent burden co-efficient (ratio of population of working ages 10-64 in Indonesia - - - to that of non-working ages) is 52.9 on an average and 55.7 in South Sulawesi. This means that in order to raise per capita income, South Sulawesi must bear a dependent burden 2.4% higher than the national average. (Dependency ratio is estimated by other standard is as following example:

Example: On the table 5.2. the dependency ratio for South Sulawesi in 1971 was 87 and it estimated to become 90 in 1986. This means that the population belonging to the productive ages is more than that belonging to the

not productive-yet ages plus that of the not-productive-any-longers ages. What is referred to the productive-aged population is the people aging from 15 to 64 years. The age under 15 years is considered to be not productive yet, while that above 65 years is considered to be not productive any longer)

Table 5.1. Population growth in South Sulawesi and D Zone of Indonesia

Year	Total population (Persons)	Population Increase *	
		(Persons)	(%)
1971	5,179,911	112,174	2,166
1972	5,292,085		
1973	5,296,191	4,106	0,077
1974	5,339,320	43,129	0,814
1975	5,423,188	83,868	1,571
1976	5,654,802		

Remark: \* Self Analysis

Source: Kantor Sensus & Statistik Prop. Sul-Sel (after analysis)

And Lowerer in 1972 and 1973 period. In this period (1972-1973), in South Sulawesi there are 8 Kabupatens to experience decreased population.

Fig. 5.1. Growth of population

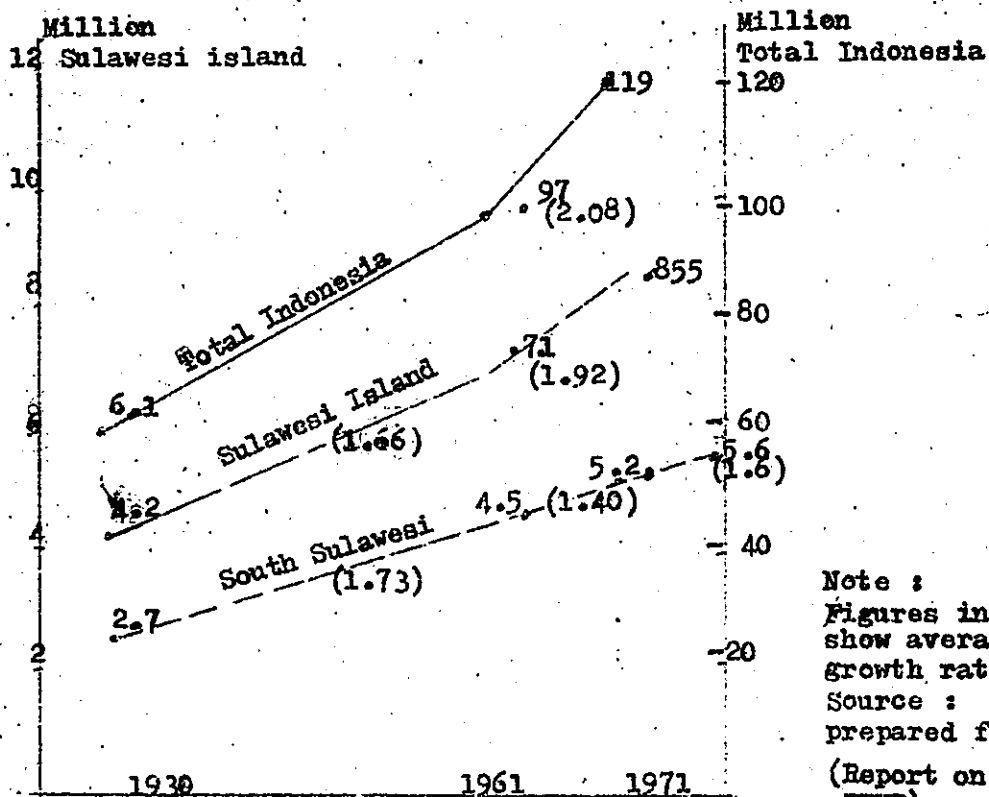
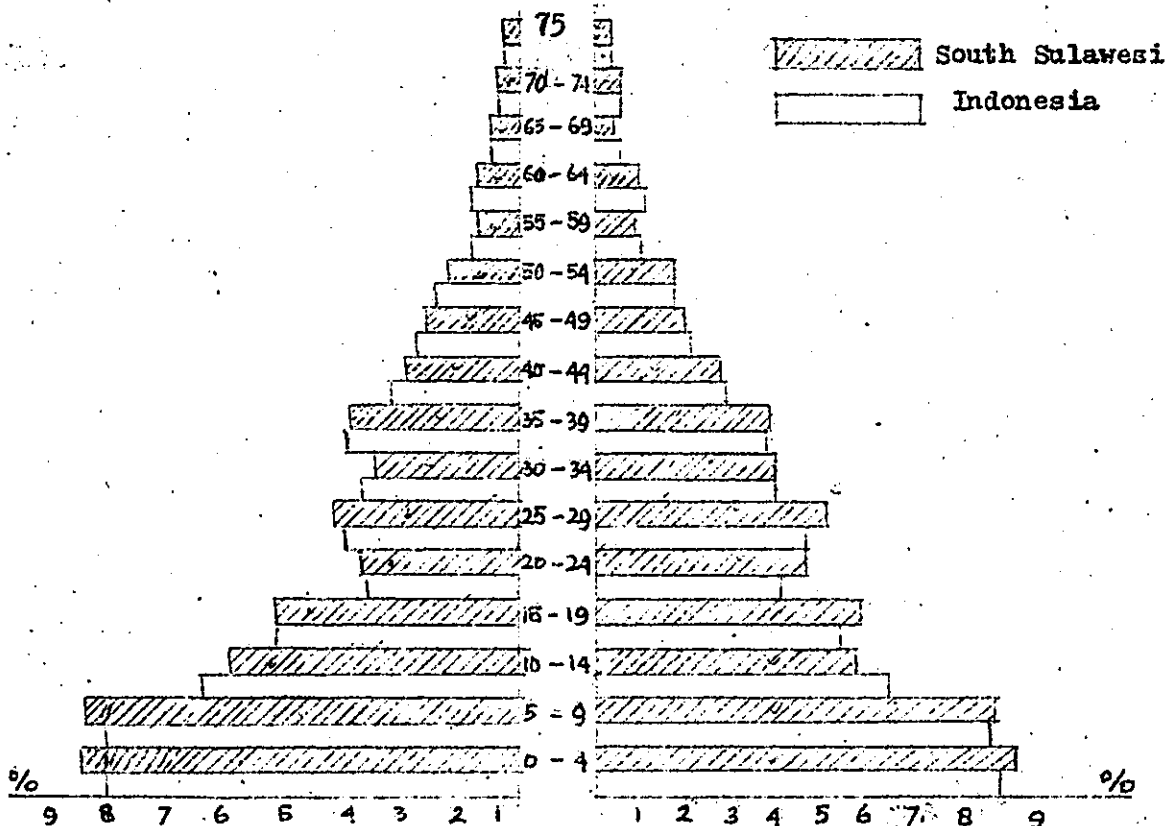


Fig. 5.2. Composition of Population by Age Group (1971)



(Source) Prepared from 1971 Census/Report on Study for IEUP.



Table 5.2. Dependency Ratio of South Sulawesi

No. Year	(a) Unproductive population ( 0 - 14 )	(b) Out numbered Productive Prop. ( 65 + )	(c) Productive Population ( 15 - 64 )	Dependency Ratio. $\frac{(a + b)}{c}$
1. 1971	2,283,376	130,662	2,765,873	0.87
2. 1976	2,490,555	142,570	3,021,677	0.87
3. 1981	2,729,158	155,609	3,301,287	0.87
4. 1986	3,016,473	169,854	3,535,756	0.90

Remarks: 1. Dependency Ratio is meaned;

Number of unproductive Population + Number of outnumbered Productive Population divided with the number of Productive Population.

2. Dependency Ratio of D zone, no calculated, become no data (Especially Age Group data).

Sources: A. From No. 1 to No.2 : Statistic Office South Sulawesi Province

B. From No. 3 to No.4 : Self analysis by Cohort Method.

3) Female population is larger than male population.

Indonesian male population is 4.9% smaller than female population in 1971. In South Sulawesi Province, the gap expands to 3.9% on an average in 1976 and to 18.6% in the 15-44 age bracket. (16.5% in 1971) <sup>5005</sup> These three facts come from the exodus of population that took place in 1951-'76. Generally, a change in population is determined by natural increase (births minus deaths) and social increase (inflow minus outflow). However, there is no reason to believe that the natural increase rate of South Sulawesi population was higher than those of other provinces. In Table 5.3, which compares some indexes regarding natural increase of population, the rate of infant population is the highest in Sulawesi Island and average in South Sulawesi Province, and the rate of female reproductive age (15-44) to total population is the highest in South Sulawesi. These facts provide no reason to believe that the natural increase rate of South Sulawesi population was lower.

Table 5.3. Population Increase Rate and Infant Population Rate by Region

	(1) Total population (1,000)	(2) 1951/71 Annual Increase (%)	(3) 0-4 age (1,000)	(4) 15-44 Female (1,000)	(5) Infant (3)/(4)	(6) (4)/(1)	(7) (3)/(4)
Total	119232	2.08	20018	26126	0.168	0.219	0.766
Java, Madure	76103	1.91	12271	17496	1.161	0.230	0.701
Sumatra	20813	2.83	3745	4148	0.181	0.199	0.903
Kalimantan	5152	2.31	845	1091	0.164	0.212	0.775
Sulawesi	8335	1.92	1564	1866	0.183	0.219	0.858
South Sulawesi	5180	1.40	873	1222	0.169	0.236	0.714

(Source) Prepared from 1971 Census

Supposing the annual natural increase rate of population of South Sulawesi in 1961-1971 was equal to the national average of 2.08% (disregarding migration with foreign countries), the province's population in 1971 would be:  $(1961 \text{ population}) \times (1 + 0.0208)^{10} = 5,550,000$

<sup>5006</sup> However, since the actual population in 1971 was 5,190,000, there must have been an outflow of 360,000. At the same time, according to the 1971

Census, about 130,000 people came from other provinces to live in South Sulawesi Province during the ten years to 1971. When this figure is taken into account, the outflow reaches nearly 500,000 . (and nearly 58,000 per year in 1971-1976 based on same method)

5007. On the other **hand** outflow of population from South Sulawesi Province are about 10,800 through the harbour.

The data concerning the number of population of South Sulawesi Province flowing **ind and out** of the province is hard to be accumulated; this is due to the fact that they come and go through many harbours, both by trade ships and by sailing boats (usually the **Penisi** boats) of their own.

Thus a record is imposible, excep for the ones coming and going through the harbour of Ujung Pandang and Pare-Pare.

The records of the inflow and outflow of people through the harbour of Ujung Pandang and Pare-Pare can be seen in table 5.4.

Table 5.4. Population Drain from South Sulawesi Province to pass through Ujung Pandang and Pare-Pare Harbour (1967-1976)

Year	Ujung Pandang			Pare-Pare		Total	
	i n	o u t	±	i n	O u t	±	±
1967	34,114	30,415	3,699	645	1,967	- 1,322	+ 2,377
1968	32,341	30,791	1,550	1,654	3,719	- 2,065	- 515
1969	35,792	32,685	4,107	884	4,225	- 3,341	+ 766
1970	28,363	33,160	- 4,797	934	6,539	- 5,605	-10,402
1971	33,145	39,285	- 6,140	2,872	8,178	- 5,306	-11,446
1972	32,995	44,860	-11,865	3,872	8,005	- 4,133	-15,998
1973	30,511	44,233	-13,722	4,547	11,008	- 6,461	-20,183
1974	25,968	47,505	-21,537	3,428	13,293	- 9,865	-31,402
1975	23,721	27,294	- 3,573	11,045	17,924	- 6,879	-10,452
1976	20,931	23,769	- 2,838	15,887	23,889	- 8,002	-10,840
Total	298,881	353,997	-55,116	45,768	98,747	-52,979	108,095

sources: statistic of Harbour Office, Ujungpandang and Pare-Pare

4) Population distribution

5008. The population of South Sulawesi is almost evenly distributed across the province except the mountainous area in the north. This characteristic explains the fact that the main industry of the province is agriculture and that almost all arable land is in use.

5009. A total of about one million people, or about 20% of the population of the province live in urban areas. Ujung Pandang, capital and the biggest city of the province, has a population of 560,000 or about 60% of all city dwellers. In terms of population, Ujung Pandang is the nation's 7th largest city after Palembang, and is a distribution base for agricultural products of the province and a base for fishing in Banda Sea and Arafura Sea. However, because of insufficient opportunities of employment, the city cannot afford to embrace all inflow of population, and thus faces such problems as unemployment and population outflow.

5010. Ujung Pandang's population increased at an annual rate of 1.7% from 380,000 in 1961 to 430,000 in 1971. With the increase rate lower than the natural increase rate, Ujung Pandang is a city of population outflow. About 300 km to the north of Ujung Pandang is the province's second largest city, Pare-Pare, which is on Tempe lowland and faces Makassar Straits. The city's population is 72,000.

5011. The average number of family members across the province is 5.4 which is higher than in other provinces; 5.3 in rural areas and 5.35 in urban areas. Interestingly, urban families are larger than rural families.

5012. In 1974, aliens registered at the Ujung Pandang Immigration Bureau totalled 41,084 including 39,682 Chinese, 342 Indians, 217 Japanese, 126 Americans, 121 Italians and 109 Philipinos.

5013. The province having the largest number of population in D Zone of Indonesia is that of South Sulawesi Province, and that with the smallest number of population is Southeast Sulawesi Province. However, the most densely populated province is the West Nusa Tenggara Province and the most scarcely populated one is the Irian Jaya Province (see table 5.5.).

Table 5.5. Density of the provinces in D Zone (1971)

No. Province	Population		Areaage (km <sup>2</sup> )	
	1 9 7 1		Geografic	Agraris
1. North Sulawesi	1,718,155		19,023	3,518
2. Central Sulawesi	1,913,662		69,726	2,832
3. South Sulawesi	5,179,911		72,761	7,375
4. South East Sulawesi	714,120		27,686	1,511
5. East Nusa Tenggara	2,202,213		20,177	2,892
6. West Nusa Tenggara	2,294,945		47,876	6,530
7. Maluku	1,088,945		74,505	2,599
8. Irian Jaya	923,440		421,981	-
T o t a l	15,035,591		753,735	27,257

No. Province	Density (Persons/km <sup>2</sup> )	
	Geografic	Agraris
	1 9 7 1	
1. North Sulawesi	90,3	408,3
2. Central Sulawesi	13,1	322,6
3. South Sulawesi	71,1	702,3
4. Southeast Sulawesi	33,8	472,6
5. East Nusa Tenggara	109,1	761,4
6. West Nusa Tenggara	47,9	351,4
7. Maluku	14,6	418,9
8. Irian Jaya	2,1	-

Note: \* Excluded Irian Jaya,  
Self analysis

Remarks: a. Geografic Density =  $\frac{\text{Total Population}}{\text{Total Area}}$

b. Agraris Density =  $\frac{\text{Total Population}}{\text{Agricultural Land area}}$

Source: From No. 1 to No.4 : Intern Report of SRDS, and from No.5 to No.8 : Survey Agro-ekonomi, Inventarisasi Data, Survey Proyek Pembinaan Pembangunan Pertanian Regional/Milayah, Wilayah Pembangunan Utama-D, 1976, page 3.7-3 and page 3.7-5

5) The literacy rate.

5014. The literacy rate, both of the Latin language and of other dialects, is the highest in Kotamadya Ujung Pandang and Pare-Pare.

This may be caused among others by the better educational facilities, the kinds of jobs and the influences of environment. The Kabupaten's where the largest number of illiteracy occurs are those of Takalar and Maros, which are relatively close to the Ujung Pandang (see table 5.6)

Table 5.6. Literacy Population (10 years more) in South Sulawesi Province by Kabupaten (1971)

No.	Kabupaten/ Kotamadya	Total Population 1	Literacy	
			Indonesian 2	% 3
23.	Mamuju	47,611	24,552	51.5
01.	Luwu	218,621	134,298	61.4
22.	Majene	53,550	30,206	56.4
21.	Polruis	203,251	114,939	56.5
02.	Ta'tor	195,560	100,323	51.3
19.	Arrekang	79,321	33,936	45.3
18.	Sidrap	122,523	51,328	41.8
04.	Wajo	227,314	100,317	44.1
03.	Soppeng	161,166	77,508	48.0
16.	Barru	91,935	50,402	54.8
15.	Pangkep	135,209	58,419	43.2
14.	Maros	127,428	40,820	32.0
12.	Gowa	255,167	121,558	47.6
06.	Sinjai	96,314	32,240	33.4
07.	Bulukumba	170,429	83,464	48.9
10.	Jeneponto	128,035	50,701	39.5
09.	Bantaeng	58,492	24,369	41.6
11.	Takalar	104,325	35,882	34.3
08.	Selayar	66,817	27,975	41.8
13.	Ujung Pandang	305,564	229,928	75.2
17.	Pare-Pare	48,510	32,287	68.6
T o t a l		3,457,073	1,682,637	48,

Source: Biro Pusat Statistik, Sensus Penduduk 1971

(Continue)

Seri E No.23 page 60.

Table 5.6. ( Continued )

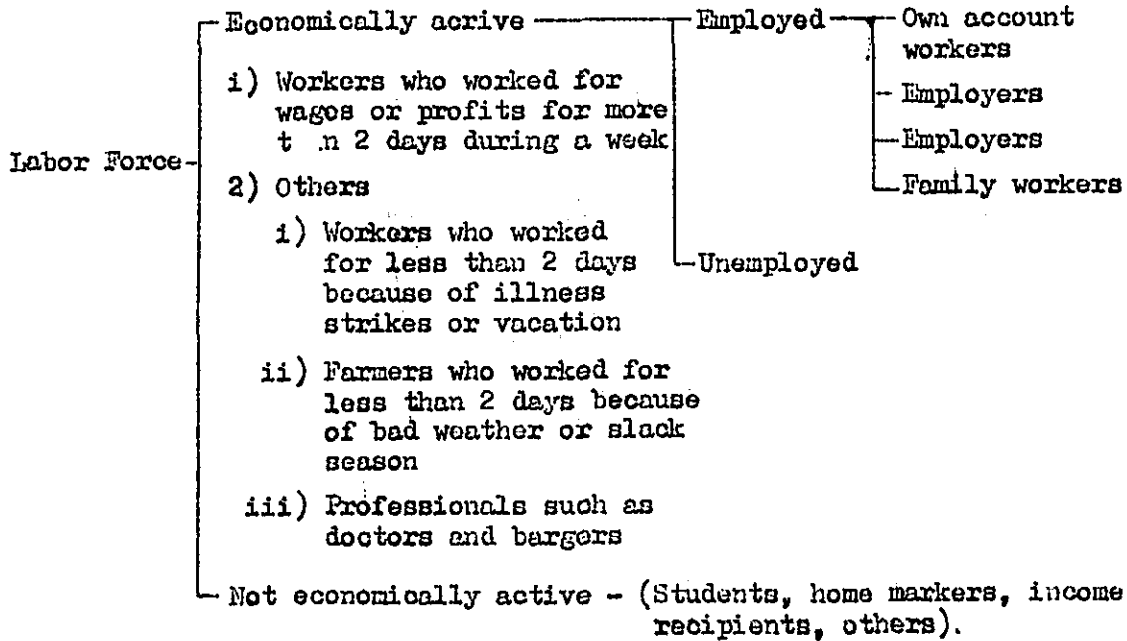
I l l i t e r a c y			
Foreign 4	% 5	Total 6	% 7
24,913	52,326	22,698	47,674
137,106	62,326	81,515	37,286
31,675	59,150	21,875	40,850
118,062	58,087	85,189	41,913
101,214	51,756	94,346	48,244
76,654	45,872	90,451	54,128
36,753	46,335	42,568	53,665
53,838	43,941	68,685	56,059
101,642	44,714	125,672	55,286
79,610	49,396	81,556	50,604
50,768	55,222	41,167	44,778
63,971	47,313	71,238	52,687
174,197	44,345	218,629	55,655
48,150	37,786	79,278	62,214
123,046	48,222	132,121	51,778
37,431	33,864	58,883	61,136
39,422	52,469	81,007	47,531
53,333	41,655	74,702	58,345
25,735	43,997	42,757	56,003
38,587	36,987	65,738	63,013
31,397	46,990	35,420	53,010
237,497	77,724	68,067	22,276
53,906	60,895	14,604	30,105
1,768,907	51,168	1,688,166	48,832



5.2. Labor force and employment structure

5.2.1. Present labor force and employment structure

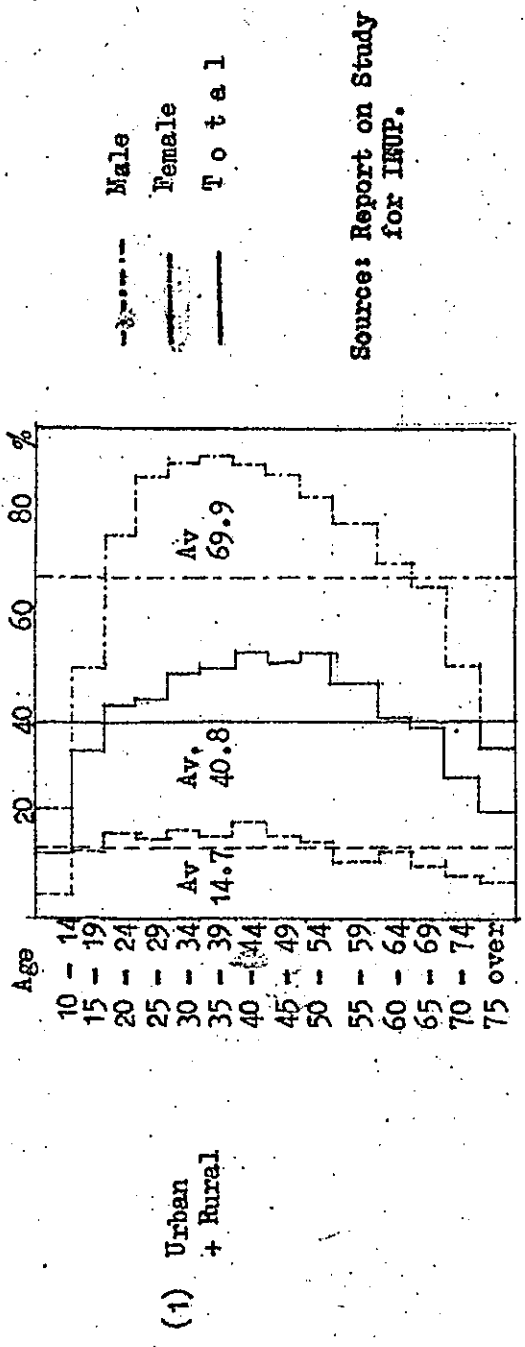
5015. Indonesian Labor Statistics classifies labor force as people older than 10 years, and the labor force is grouped as follows:



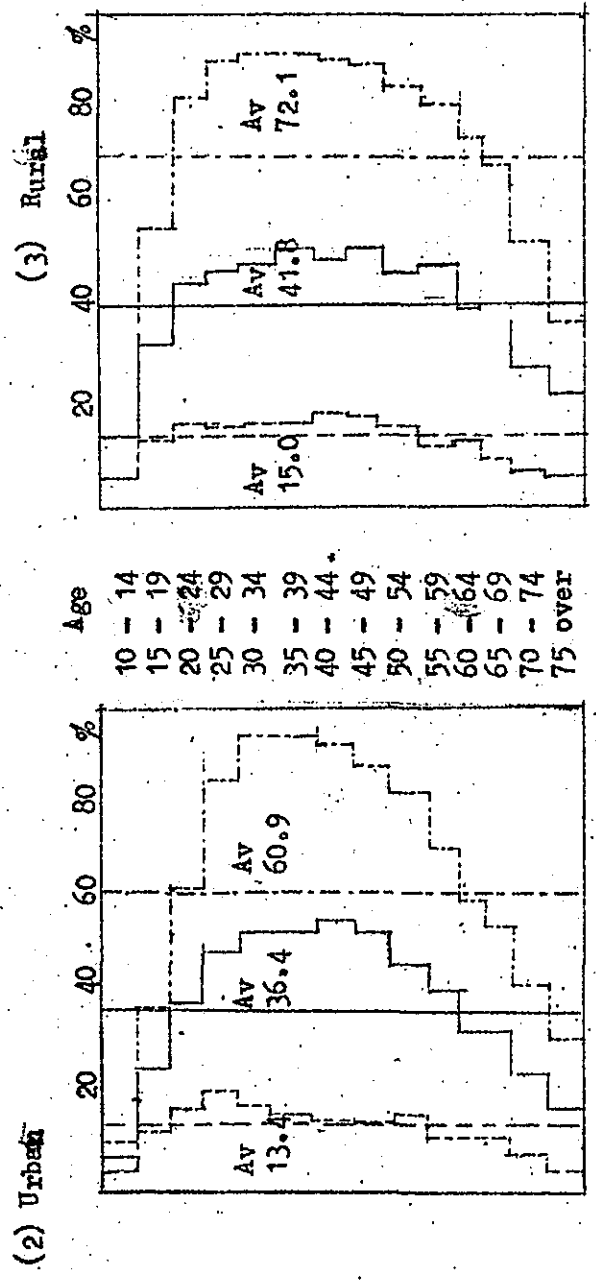
5016. According to the 1971 census, the population older than 10 years old in South Sulawesi Province in 1971 stood at 3,460,000, or two-third of the total population of the province. The economically active population was 1,410,000, or 27% of the total population and 41% of the population of working ages in the province. Since more old people work in Indonesia, the rate of economically active population to the population of working ages is higher than in other Southeast Asian countries. The rate is 51% in Japan (1970), 34% in West Malaysia (1957), 31% in the Philippines (1960), 43% in India (1963) and 33% in Singapore (1957).

5016-2. As is clear from Table 5.7. the rate of labor force to the total population is 41.8% in rural areas, 36.4% in urban areas and 35.2% in Ujung Pandang City, and thus the rate is lower in more urbanized areas. As is indicated in Fig. 5.3. the reasons are: (1) more women work in rural areas; (2) more old people work in rural areas; and (3) school enrollment in urban areas is nearly double that in rural areas. The rate of working people to total population has been declining worldwide.

Fig. 5.3. Percentage of People engaged in Economic Activities by Age Group (South Sulawesi 1971). -



Source: Report on Study for INUP.



Tabel 5.7. Economical Active Population in South Sulawesi Province and Ujung Pandang.

	Economically active population		Non-economically active population				Unknown Total			
	Employed	Unemployed	Total	Students	Home-makers	Income recipients		Others	Total	
Labor force (1.000)										
South Sulawesi	1,309	102	1,411	486	1,173	53	305	2,017	29	3,457
Urban areas	211	26	237	141	203	10	55	409	5	651
Rural areas	1,098	77	1,175	345	970	42	250	1,607	24	2,806
Ujung Pandang	97	11	108	72	91	5	28	196	2	306
Composition (%)										
South Sulawesi	37.6	3.0	40.8	14.1	33.9	1.5	8.8	58.3	0.8	100
Urban areas	32.4	4.0	36.4	21.6	31.2	1.6	8.4	62.8	0.8	100
Rural areas	39.1	2.7	41.8	12.3	34.6	1.5	8.9	57.3	0.9	100
Ujung Pandang	31.8	3.4	35.2	23.6	29.8	1.6	9.0	64.0	0.6	100

(Source) 1971 Census

5017. Tables 5.8 and 5.9 show the economically active population and unemployment by industry. In South Sulawesi Province, workers in Indonesian's basic industry, agriculture, account for two-thirds of the total working population, followed by government offices and service which account for nearly 10 % and commerce and manufacturing which account for 7 - 8 %, respectively. In Ujung Pandang City, service account for one-third of the total working population, followed by commerce, transportation and communications. In terms of Colin Clark's industrial classification, the percentages of the primary, secondary and tertiary industries come to 66 : 8 : 26 in South Sulawesi Province and to 8 : 12 : 80 in Ujung Pandang City. Since the city embraces only a small agricultural area, the percentage of the primary industry is naturally low. However, the very high percentage of the tertiary industry is the result not so much of high level of industrialization as of the retarded development of the secondary industry. It is expected that as industrialization progresses in the future, the relative weight of the secondary industry will expand and that of the tertiary industry will decline.

5018. One of the major labor problems in South Sulawesi is unemployment, and insufficient employment opportunities have led to an outflow of population. According to the 1973 data, 100,000 people, or 7.3 % of the economically active population of the province were seeking jobs. The unemployment rate is 6.5 % in rural areas, whereas it is 10.9 % in urban areas, and thus poses a more serious problem. The educational level of these unemployed people is very low : most of them do not receive school education or they have left primary or middle schools halfway and some of them, having failed to find jobs even after graduation from professional schools or colleges, go to Java or other parts of the country.

5019. The figures in Table 5.9 show actual unemployment only, and concealed unemployment and disguised unemployment in the agricultural and services industries are believed to reach a sizable figure. In fact, according to the report on the pre-feasibility study of the industrial estate conducted by the South Sulawesi Province Government, the unemployment rate in a wide sense is 30 % in urban areas and 60 - 70 % in rural areas.

5020. Home makers account for majority of all non-economically active population, and approximately amount to the same number as households in South Sulawesi Province. The ratio of students to total residents in urban areas is nearly double (continue next page) that of rural areas partly because higher education facilities center on cities and school enrollment in rural areas is low.

"Others" in Table 5.7 mean the sick or older people under the care of government or private institutions.

Table 5.8. Economically Active Population by Industry (1971)

	South Sulawesi						Ujung Pandang	
	Urban area		Rural Area		Total		1,000	%
	1,000	%	1,000	%	1,000	%		
Agriculture, forestry & fishery	49.172	20.7	686.945	75.5	936.117	66.3	10.701	7.7
Mining	466	0.2	524	0.1	990	0.1	385	0.3
Manufacturing	18.167	7.7	86.142	7.3	104.309	7.3	10.610	7.6
Power, gas, water-service	523	0.2	515	0.1	1.038	0.1	437	0.3
Construction	7.463	3.2	6.308	0.5	13.771	1.0	5.724	4.1
Commerce, hotel	52.165	22.0	58.721	5.0	110.886	7.9	38.041	7.4
Transport, Communication	20.900	8.8	22.205	1.9	43.105	3.1	16.062	11.6
Banking, insurance	1.680	0.7	669	0.1	2.349	0.2	1.378	1.0
Service	67.109	23.5	69.799	5.9	136.908	9.7	45.399	32.7
Unclassifiable	19.414	8.2	42.440	3.6	61.854	4.3	10.239	7.4
<b>T o t a l</b>	<b>237.059</b>		<b>1.174.268</b>		<b>1.411.327</b>		<b>138.976</b>	
		100.0		100.0		100.0		100.0

(Source) 1971 Census.

Table 5.9. Unemployment by Industry (1971)

	South Sulawesi						Ujung Pandang	
	Urban Area		Rural Area		Total			%
		%		%		%		
Agriculture, forestry & fishery	2.877	5.9	32.945	3.7	35.822	3.8	230	6.7
Mining	41	8.8	19	3.6	60	6.1	21	6.7
Manufacturing	833	4.6	2.309	2.7	3.142	3.0	468	5.3
Power, gas, water-service	70	13.4	0	0.0	70	6.7	63	17.8
Construction	325	4.4	88	1.4	413	3.0	108	2.3
Commerce, hotel	1.427	2.7	1.766	3.0	3.193	2.9	602	2.0
Transport, Communication	642	3.1	1.088	4.8	1.730	4.0	314	2.4
Banking, insurance	21	1.3	0	0.0	21	0.9	21	1.9
Service	2.712	4.0	3.414	4.9	6.126	4.5	1.255	3.4
Unclassifiable	5.656	29.1	14.345	33.8	20.001	32.3	2.041	24.5
New labor force	11.118	-	20.766	-	31.884	-	5.222	-
<b>T o t a l</b>	<b>25.722</b>	<b>10.9</b>	<b>76.740</b>	<b>6.5</b>	<b>102.462</b>	<b>7.3</b>	<b>10.395</b>	<b>9.7</b>

5.2.2. Estimation of Agriculture Labor Employment

5021. 1) According to the data of BAPFEDA, the number of labor force in 1961 and 1971 was respectively 2,803,869 and 3,349,071 persons. The force referred to here is the South Sulawesi inhabitants ranging from 10 to 54 years of age. For 1977 to 1979 it is projected as shown on table 5.10.

5022. It is also known from the data found that the number employment in South Sulawesi was 1,621,429 manpower in 1961, and 1,861,934 manpower in 1971. Estimated to the period 1977 to 1979 it will be :

1977 - 2,023,790 manpower

1978 - 2,052,021 manpower

1979 - 2,080,647 manpower

5023. From the data above we see that the labor supply will only be absorbed respectively 57.8 % for 1961, 55,6 % for 1977 and from then on 60.4 %.

5024. The number and estimation of the employment for agricultural sector in South Sulawesi are as follows :

1961 - 1,346,832

1971 - 1,548,532

1977 - 1,671,040

1978 - 1,684,492

1979 - 1,728,269

or an average of 49.0 % of the number of labor supply available each year. This means that if it is estimated that about 65 % of South Sulawesi inhabitants live on the agricultural sector. It is obvious that the agricultural sector still requires a large number of labor force.

Table 5.10. Estimation by Agricultural Labor in 1971 - 1976.

( Male )

Age- group	Population of farm haushold		Agril. Labor	
	1971	1976	1971	1976
10 - 14	293.534	315.608	49.355	53.068
15 - 19	250.079	268.885	98.451	105.858
20 - 24	160.565	172.639	84.617	90.983
25 - 29	186.923	200.980	118.697	127.625
30 - 34	145.059	155.967	92.540	99.496
35 - 39	170.903	183.755	114.644	123.262
40 - 44	111.696	120.095	74.089	79.656
45 - 49	94.003	101.072	64.532	69.386
50 - 54	69.989	75.260	49.317	53.023
55 - 59	42.788	46.005	28.664	30.818
60 - 64	44.389	47.727	28.169	30.289
65 - 69	24.756	26.617	14.343	15.422
70 - 74	22.993	24.722	10.526	11.318
75 +	17.995	19.348	5.500	5.914
<b>T o t a l</b>	<b>1.635.672</b>	<b>1.758.680</b>	<b>883.444</b>	<b>896.118</b>

- Note : 1. Agricultural Labor in 1971 from Agricultural Population Sensus 1971.  
 2. Agricultural Labor in 1976 Conform of the 1971 Population Census.  
 3. Estimated Agricultural Labor by Cohort Share Trend Method.

( Female )

Age-Group	Population of farm haushold		Agril. Labor	
	1971	1976	1971	1976
10 - 14	267.004	295.652	6.999	7.749
15 - 19	271.592	300.732	15.355	17.001
20 - 24	216.876	240.146	11.289	12.499
25 - 29	239.322	265.000	14.687	16.263
30 - 34	185.248	205.124	13.306	14.732
35 - 39	181.573	201.005	13.116	14.523
40 - 44	128.029	141.766	9.587	10.615
45 - 49	93.266	103.273	7.628	8.445
50 - 54	83.419	92.369	6.459	7.152
55 - 59	40.672	45.036	2.470	2.734
60 - 64	49.482	54.791	3.410	3.775
65 - 69	23.250	25.745	942	1.044
70 - 74	24.023	26.600	873	925
75 +	17.645	19.538	474	525
<b>T o t a l</b>	<b>2.659.497</b>	<b>2.944.846</b>	<b>106.560</b>	<b>117.984</b>

5.3. Non Agricultural Industry

5.3.1. Mining

5025. As its name indicates, Sulawesi (island of metals) embraces a variety of mineral resources. However, most of them, except nickel and laterite, are not developed because investigation of quantity and quality of deposits have been slow and the infrastructure for mining and transportation has remained undeveloped.

Nickel mines were investigated by Japan during World War II.

5.3.2. Manufacturing

5026. A more detailed account of the manufacturing industry will be given later, and its gist is summarized into the following eight points:

- i) The relative weight of the manufacturing industry in the Shout Sulawesi economy is estimated at about 5 %, and it remains to be developed. However, under the first 5-year development plan (PELITA I), the industry has grown rapidly. The industry's production increased at an annual rate 25.4 % from Rps. 7.6 billion in 1968 to Rps. 29.6 billion in 1974.
5027. ii) Traditional labor-intensive industries with low capital equipment ratio (amount of capital investment per employee) such as home industry. Light industry and textile industry (mostly - local silk fabrics) account for nearly 80 % the total production. A fullscale modern industry runs with certain amounts of capital and technology is limited to a few companies including a flour mill and a galvanized iron factory in Ujung Pandang. Recently, the share of modern factories for cement, secondary steel products and repairing is expanding.
5028. ~~iii~~) The average value added in the manufacturing industry during the first 5-year development plant (1968-1974) was Rps. 5,4 - billion, of which light industry accounted for 47,2 %, home industry 4,8 %, textile industry 2,1 %, chemical industry 37,2 % and maritime industry 1,3 %.
5029. iv) Manufacturing companies in 1973 totalled 1,495, of which foods, drinks and tobacco accounted for 444 (29.7%), iron and metal and machines including automobile repair 274 (18.3%), non-metal mining such as bricks, slates, ceramics and coal 247 (16.5%) and textile 218 (14.6%) including 129 handweavers.



5030. v) These companies are distributed as shown in Table 5.11. About 40 % companies in terms of the number and employees and nearly 80 % in terms of investment and production operate in Ujung - Pandang and its neighboring Kabupatens such as Gowa, Maros and Takalar. Pare-Pare in the northern area also attracts many companis.
5031. vi) Modern industries with more than Rps. I billion are all run by the state, or joint venture operations with non-puribumi or foreign capital. They include flour milling, cement, paper making, textile, sugar and galvanized sheet iron.

Tabel 5.11. Geographic Distribution of Manufacturing Companies in South Sulawesi Province (1973).

Kabupaten	Investment Rps. Billion (%)	Major industries and No. of companies
1. Ujung Pandang	10.80 (59)	Food, drinks, tobacco (149); metal, wood (126); others (100)
2. Gowa, Takalar, Jenepono	2.26 (13)	Brick, slate (82); others (10)
3. Maros, Barru	1.22 (7)	Tobacco (32); cutlery (23) others (10)
4. Pare-Pare, Pinrang	3.39 (18)	Food, drinks, tobacco (27); metal products (20); others (10)
5. Sidrap, Enrekang	0.02 (0)	non-metal mining (19); agriculture(11); textiles(12); others (11)
6. Bolmas, Majene, Mamuju	0.17 (1)	Food, drinks, tobacco(23); textiles, sewing, carpeting, leather, ship fittings(15); non-metal mining(12); others (12)
7. Tana Toraja	0.07 (0)	Textiles, sewing, carpeting, leather(32); wood, carvings(13); non-metal mining(25); non-metal products(14); others (14)
8. Luwu	0.05 (0)	Wood, furniture(22); food, drinks, tobacco (15); others (10)
9. Wajo	0.11 (1)	textiles(108); metal products(22); others (15)
10. Soppeng	0.07 (0)	Tobacco(147);fabrics(12); non-metal mining (11).
11. Bone	0.09 (0)	bricks(30); tobacco(16); others(11)
12. Bulukumba, Sinjai, Selayar	0.17 (1)	Silverware(16); fabrics(14); furniture - (14); metal products(12); others(10).

(Source) Pre Feasibility Study for Industry Estate in Ujung Pandang.

5.3.3. Trade and distribution

i) Export and import

5032. According to the table 5.12. and 5.13., in the early 1970, imports continued to amount to \$ 10 million, of which raw materials and intermediate goods accounted for about one half, capital goods for 30-40% and consumer goods for the rest.

5033. In 1973, however, imports rose to more than five times due to rapid increase of foods and other other consumer goods stemming from a slump in agricultural production. And imports of consumer goods including food aid from abroad in 1973 accounted for 52% of the total imports. (Food aid in 1972-1973 accounted for 21% of all consumer goods imports.)

5034. Main imports are corns from Canada, the U.S. and Australia, rice from Hongkong, Burma and South Korea, machine parts from the U.S., Japan and Australia, cement from the Philippines, Japan and South Korea, zinc from Taiwan and Japan, steel products from Japan and automobiles from Japan.

5035. South Sulawesi's main export products which amounted to more than \$ 200.000 in 1974 include blackwood (\$ 400.000), frozen shrimps (\$ 2,174,000), coffee (\$ 2,200,000), wheat bran (\$ 1,629), roes of flying-fish (\$ 920,000), rubber (\$ 802,000), cocones (\$ 760,000), buffaloes (\$ 293,000), copras (\$ 260,000) and nutmegs (\$ 241,000). These products account for 87% of the total exports. The sharp increase in exports in 1971-1973 was largely the result of increased export of wood, leather, shrimps and coffee. On the other hand according to table 5.14. export of shrimps increase rapidly from 13.6% of total value in 1973 to 28.7% in 1976.

ii) Interinsular trade.

5036. Interinsular trade of South Sulawesi Province heavily depends on agricultural production because agricultural products such as rice and sugar are main items of trade. The interinsular trade fluctuates from millions of rupiahs to hundreds million of rupiahs from year to year, and the trade balance is always in favor of South Sulawesi Province. The province has the strongest trade relations with West Java and East Java, followed by those with North Sulawesi and North Sumatra.

iii) 3 distribution system.

5037. Commodity distribution in South Sulawesi Province takes the following three forms. The first is barter through small-scale village traders and processors of agricultural products (flouring, sugar-making, tobacco and handicraft). This form of distribution is practised in the area where the self-supporting economy is predominant. Since it not so much the trade of surplus products as the exchange of daily necessities, it does not have a great impact on the province's external trade.

5038. The second form of distribution is designed as a profit pursuing commercial dealing and is conducted by local truckers, merchants, brokers, and money lenders. This form of distribution is larger both in size and coverage than the previous one. In many cases, these distributions have a great impact on traditional producers and thus control both production and distribution.

5039. The third form of distribution is through government organizations, e.g. rice by BULOG and oil by Pertamina. This form has the greatest impact on the overall distribution set-up.

5040. Generally speaking, the distribution system in South Sulawesi Province still remains to be developed, and thus hampers the development of production activities. For instance, the producers prices of rice, copra and sugar are held very low, discouraging producers and hampering the expansion of production. As the copra price is also low, there will be no rapid increase in its production. Farmers have not sufficient funds of their own and are forced to sell their products at low prices, often immaturely.

5041. In urban areas, the distribution system is being modernized constantly, but it will take long before the wave of modernization reaches rural areas.

Table: 5.16: Distribution of gross product by sector in South Sulawesi Province (1969 - 1976)

Sector	Unit: %							
	1969	1970	1971	1972	1973	1974	1975	1976
1) Food crops	62.0	60.9	56.0	57.5	56.0	62.9	57.3	57.0
2) Estate crops by farmers	48.3	47.4	40.5	43.5	33.2			
by other	6.2	5.8	6.0	4.2	11.3			
3) Fishery	0.2	0.2	0.2	0.2	0.2			
4) Forestry	4.6	4.8	0.3	5.3	6.8			
5) Husbandry	0.5	0.2	0.2	0.4	0.9			
	2.2	2.4	2.8	3.9	3.6			
Mining	0.8	0.9	1.1	1.5	1.3			
Industry	5.7	5.4	4.4	6.2	6.2			
Construction	1.4	1.4	1.9	2.7	2.2			
Electricity, Gas and Tap water	0.2	0.3	0.2	0.2	0.2			
Transportation & Communication	1.8	2.0	1.8	1.8	1.6			
Wholesale & retail trade	16.9	16.8	21.9	18.4	19.8	37.1	42.7	43.0
Banks & other financial agencies	1.4	2.4	2.5	1.3	1.3			
House rents	4.1	3.7	4.0	4.2	4.1			
Government & Security	4.8	5.3	4.7	5.0	4.6			
Services	0.9	0.9	1.5	1.2	2.4			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: BAPPEDA, SulSel.

Table 5.17. Distribution of regional net income and income per capita in South Sulawesi by Bloc.

Unit: 1,000 Rupiah-s.

	1974		1975		1976	
	Regional	per capita	Regional	per capita	Regional	per capita
I	38,123,929	68,240	51,346,083	91,444	59,542,142	99,756
III	14,003,798	24,155	28,078,498	45,505	29,025,823	46,701
IV	12,943,463	34,727	16,045,360	42,060	22,955,545	53,803
II	3,197,102	73,653	4,268,849	74,561	6,029,705	78,001
V	2,807,768	35,368	3,535,730	38,629	4,965,186	52,195
Total	71,876,060	47,229	103,274,528	50,439	122,518,401	66,091
Average	79,559,217		129,365,611		126,361,125	

Source : BAPPEEDA of South Sulawesi Province.

5.5. Land holding

5.5.1. Number of farm household and farms

5055. According to the Agricultural Census 1973, the total number of farm household is 952,873 (source: a data from Agricultural Extension Service, South Sulawesi) with an acreage of 843,534 ha.

5056. In comparison with agricultural farms <sup>1)</sup> and estates farms <sup>1)</sup>, there is a large difference as total number 648,707 for agricultural farms with an acreage of 737,455 ha, and 92 for estate farms with an acreage of 106,079 ha, while the average of size of farms by type are 1.14 ha for agricultural farms and 1.15 ha for estates farms (see table 5.18 and 5.19-1).

Table 5.18. Agriculture and estates farms in South Sulawesi

No.	Type of farms	Number of farms	Acreage (ha)	Average (ha)
1.	Agricultural farms	648,707	737,455	1.14
2.	Estates farms	92	106,079	1.15
	T o t a l	648,799	843,534	-

Source: Agricultural Census 1973 and Adjusted data by Team ATA-140

5.5.2. The conditions of land holding

5057. According to the obtained data by interview at Agricultural Extension Service, South Sulawesi, total number of farmers is 919,542-, consisting of 270,835- free workers (buruh tani/pnegarah) and 648,707- land holders. The land holders are divided for three groups as showing on the table 5.19-1.

5058. In case of the areas of developed irrigation systems, i.e. Kabupaten Sidrap and Polmas, big land holders/land owners are found as follows:

	<u>Sidrap</u>	<u>Polmas</u>
0 - 5 ha.	4,662-	81-
5 - 25	68-	178-
25 - 50	-	57-
50 - .	-	144-

(Source: a result of the study by Nazaruddin L. at Diperta in Kabupaten Sidrap and Polmas)

1) Farms means the unit areas of farming activities by type of farming. Agriculture farms oriented the farming for food crops, and estate farms are oriented the farming for estate crops.

5059. And following data also shows a condition of land holding with number of tractors on developed irrigation system:

<u>Items</u>	<u>Sidrap</u>	<u>Pinrang</u>	<u>Polmas</u>
Number of farmers	178,935-	171,910-	225,874-
Number of tenants	114,190-	88,210-	-
Percentage of tenant	63.80-	51.31-	-
Acreage of holding	33,894-	47,597-	77,630-
Number of tractors	148-	110-	53

Source: A result of the study by Nazaruddin L. at  
Diperta of Kabupaten-s Sidrap, Pinrang  
and Polmas.

Table 5.19-1. Number of Farmers by Tenure in South Sulawesi (1973)

No.	Size of Holding (ha)	Number of Farms		Whole area owned		Part of area owned		Not owned	
		Total	(%)	No. of farms	(%)	No. of farms	(%)	No. of farms	(%)
1.	> 0.10	14,520	2.2	11,123	76.6	2,148	14.8	1,249	8.6
2.	0.10 - 0.20	45,890	7.1	32,447	70.7	9,065	19.8	4,378	9.5
3.	0.20 - 0.30	49,486	7.6	32,461	65.2	10,704	21.6	6,321	12.8
4.	0.30 - 0.40	40,356	6.2	26,378	65.2	11,177	27.7	2,851	7.1
5.	0.40 - 0.50	30,254	4.7	17,701	58.5	9,922	32.8	2,631	8.7
6.	0.50 - 0.60	65,623	10.1	41,472	63.2	18,392	28	5,757	8.8
7.	0.60 - 0.75	44,528	6.9	23,532	52.8	18,385	41.3	2,611	5.9
8.	0.75 - 1.00	70,740	10.9	40,418	57.1	27,132	38.4	3,190	4.5
9.	1.00 - 2.00	137,165	28.9	107,887	57.6	72,821	38.9	6,462	3.5
10.	2.00 - 3.00	61,211	9.4	34,870	57.0	75,044	40.9	1,297	2.1
11.	3.00 - 4.00	19,872	3.1	11,463	57.7	8,150	41.0	259	1.3
12.	4.00 - 5.00	9,289	1.4	5,303	57.1	3,986	42.9	-	-
13.	5.00 - 7.50	6,770	1.0	4,677	69.1	2,003	29.6	90	1.3
14.	7.50 - 10.00	1,277	0.2	520	40.7	712	55.8	45	3.5
15.	10.00 - 15.00	1,287	0.2	663	51.5	573	44.5	51	4.0
16.	15.00 <	439	0.1	148	33.7	291	66.3	-	-
Total		648,707	100.0	391,008	60.3	220,505	34.0	37,194	5.7
Total area (ha)		737,455	(100%)	422,419	57.3	290,096	39.3	24,940	3.4

Source: Agricultural Census 1973.



Table 5.19-2. Number and area of farmers by size of holding  
in South Sulawesi (1973)

No.	Size of Holding	Number of farms	%	area	%
1.	0.10 HA	14,520	2.2	841	0.1
2.	0.10 - 0.20 HA	45,690	7.1	6,421	0.9
3.	0.20 - 0.30 HA	49,486	7.6	12,083	1.6
4.	0.30 - 0.40 HA	40,355	6.2	13,195	1.8
5.	0.40 - 0.50 HA	30,254	4.7	13,195	1.8
6.	0.50 - 0.60 HA	65,623	10.1	34,480	4.7
7.	0.60 - 0.75 HA	44,526	6.9	29,349	4.0
8.	0.75 - 1.00 HA	70,740	10.9	58,595	7.9
9.	1.00 - 2.00 HA	187,165	28.9	245,818	33.3
10.	2.00 - 3.00 HA	61,211	9.4	139,921	19.0
11.	3.00 - 4.00 HA	19,872	3.1	65,653	8.9
12.	4.00 - 5.00 HA	9,289	1.4	40,428	5.5
13.	5.00 - 7.50 HA	6,770	1.0	39,307	5.4
14.	7.50 - 10.00 HA	1,277	0.2	10,746	1.5
15.	10.00 - 15.00 HA	1,287	0.2	14,966	2.0
16.	15 ---	439	0.1	12,003	1.6
Total		648,707	100	737,455	100

Notice: 1. More than 0.5 HA

Farm household = 72.2%

Farm area = 93.8%

Average size = 1.48 HA

2. 0.50 Ha - 3.00 Ha

Farm household = 66.2%

Farm area = 68.9%

Source: Agricultural Census 1973

Part I.

5.6. The situation of integrated rural development

5.6.1. General informations

5060. 1)The South Sulawesi Province consists of 2 Kotamadya-s and 21 Kabupaten-s, 169 Kecamatan-s and 1,170 Desa-s.

The population of South Sulawesi is made up various ethnic groups. Roughly, there are four main ethnic groups, namely the Buginèses, the Makassarses, the Mandarses and Torajaneso.

5061. 2)According to the data from Directorate of Rural Development, South Sulawesi, concerning rural development by using some indicators, the general picture of the situation of rural development shows the levels of development of Desa-s in 2 Kotamadya-s and 21 Kabupaten-s can be seen on table 5.20 and 5.21.

5062. 3)Out of 1,170 Desa-s in South Sulawesi Province 45.83% of Desa-s one and only 9.20% have high level's one (see table 5.22)

5063. 4)The livelihood of Desa population are generally primary (agriculture) 83.76%, secondary (industry and handicrafts) 11.78% and very few earn their living in the tertiary (sector of service) 4.56% (see table 5.23)

5064. 5)Lembaga Sosial Desa/L.S.D. (Village Social Institute); in the 1,170 Desa-s of South Sulawesi Province, there are 109 L.S.D. (9.32%) in passive stage, 574 L.S.D. (49.06%) in developing stage and 487 L.S.D. (41.62%) in active stage.

5065. 6)For the last three years, formation of the system UDKP/Unit Desa Kegiatan Pembangunan (Unit Desa-s of the Development activities in the frame of rural development in South Sulawesi) have been attempted by conducting discussions on UDKP at Kecamatan level, workshop on UDKP at Kotamadya/Kabupaten and Provincial levels. In this forum all agencies, the community and higher education organization are involved. The location of UDKP in 23 Kecamatan-s have been decided for 1976 (see table 5.24).

Table 5.20 Level of Village Development in  
Sulawesi Selatan, 1972 - 1976

Year	Number of Villages	Swadaya villages total %	Swakarya villages total %	Swasembada villages total %
1972	1,162	603 (51.89)	543 (47.16)	11 (0.95)
1976	1,163	527 (45.31)	523 (44.97)	113 (9.72)
1976	1,170	541 (46.24)	509 (43.50)	120 (10.26)

Table 5.21. The level of village development per-Kabupaten  
in South Sulawesi (1975)

Kabupaten	Total Number of villages	Swadaya villages total	%	Swakarya villages total	%	Swasembada villages total	%
Bantaeng	15	1	6.67	13	86.67	1	6.67
Barru	24	11	45.83	9	37.50	4	16.67
Bone	205	69	33.66	129	62.93	7	3.41
Bulukumba	43	13	30.23	23	53.49	7	16.28
Enrekang	28	0	0	27	96.43	1	3.57
Gowa	48	13	27.08	33	68.75	2	4.17
Jeneponto	28	13	46.43	9	32.14	6	21.45
Luwu	143	101	70.63	42	29.37	0	0
Majene	20	20	100.00	0	0	0	0
Mamuju	27	27	100.00	0	0	0	0
Maros	41	33	80.49	8	19.51	0	0
Pangkep	80	60	75.00	18	22.50	2	2.50
Pinnang	37	6	16.22	30	81.08	1	2.70
Polmas	83	26	31.33	40	48.19	17	20.48
Selayar	20	15	75.00	4	20.00	1	5.00
Sidrap	32	13	40.63	17	53.13	2	6.25
Sinjai	38	26	68.40	8	21.05	4	10.53
Soppeng	26	4	15.38	22	84.60	0	0
Takalar	35	15	42.86	18	51.43	2	5.71
TanaToraja	65	43	66.15	20	30.77	2	3.08
Wajo	51	13	25.49	27	52.94	11	21.57
Kotamadya Pare-Pare	12	2	16.67	10	83.33	0	0
Kotamadya U.Pandang	62	3	4.84	16	25.81	43	69.35
T o t a l	1,163	527	45.31	523	44.97	113	9.72

Source: Direktorat Pembangunan Desa Propinsi Sulawesi Selatan, Klasifikasi Desa pada 23 Kabupaten/Kotamadya Daerah Tingkat II Propinsi Sulawesi Selatan, 1975.

Table 5.22 Land Productivity in the villages in each Kabupaten in South Sulawesi (1975)

Kabupaten	Total Number of villages	Low Number of villages	%	Medium Number of villages	%	High Number of villages	%
Bantaeng	15	1	6.67	9	60.00	5	33.33
Barru	24	4	16.67	17	70.83	3	12.5
Bone	205	162	79.02	42	20.49	1	0.48
Bulukumba	43	3	6.98	34	79.07	6	13.95
Enrekang	28	18	64.29	10	35.71	0	0
Gowa	48	12	25.00	36	75.00	0	0
Jeneponto	28	8	28.57	8	28.17	12	48.86
Luwu	143	80	15.94	63	44.06	0	0
Majene	20	16	80.00	4	20.00	0	0
Mamuju	27	0	0	27	100.00	0	0
Maros	41	11	26.83	27	65.85	3	7.32
Pangkep	80	32	40.00	48	60.00	0	0
Pinrang	37	7	18.92	13	35.13	17	45.95
Polmas	83	53	63.86	27	32.53	3	3.61
Selayar	20	3	15.00	17	85.00	0	0
Sidrap	32	6	18.92	13	35.13	17	45.95
Sinjai	38	11	28.95	5	13.16	22	57.89
Soppeng	26	21	80.77	5	19.23	0	0
Takalar	35	20	57.14	12	34.29	3	8.57
Tana Toraja	65	4	6.15	53	81.53	8	12.31
Wajo	51	28	54.90	21	41.18	2	3.92
Kotamadya Pare-Pare	12	6	50.00	4	33.33	2	16.67
Kotamadya u. Pandang	62	27	43.53	30	48.39	5	8.06
T t o t a l	1,163	533	45.83	523	44.97	107	920

Source: Direktorat PMD, Klasifikasi Desa, 1975.

Table 5.23 Livelihood of the village population per Kabupaten in South Sulawesi

Kabupaten	Total no of villages	1		2		3	
		No of villages	%	No of villages	%	No. of villages	%
Bantaeng	15	9	60.00	5	33.33	1	6.67
B a r r u	24	24	100.00	0	0	0	0
B o n e	205	199	97.07	5	2.44	1	0.49
Bulukumba	43	1	2.33	28	65.12	14	32.55
Enrekang	28	24	85.71	3	10.71	1	3.57
G o w a	48	45	93.75	0	0	3	6.25
Jeneponto	28	22	70.75	0	0	6	21.43
L u w u	143	137	95.80	1	0.70	6	4.20
Majene	20	20	100.00	0	0	0	0
Mamuju	27	26	96.30	0	0	1	3.70
M a r o s	41	41	100.00	0	0	0	0
Pangkep	80	77	96.25	1	1.25	2	2.50
Pinrang	37	36	97.30	1	2.70	0	0
Polmas	83	79	95.18	4	4.82	0	0
Selayar	20	19	95.00	1	5.00	0	0
Sidrap	32	30	93.95	2	6.25	0	0
Sinjai	38	38	100.00	0	0	0	0
Soppeng	26	26	100.00	0	0	0	0
Takalar	35	18	51.43	14	40.00	3	8.57
Tana Toraja	65	63	96.92	0	0	2	3.08
W a j o	51	31	60.78	17	33.33	3	5.88
Kotamadya Pare-Pare	12	7	58.33	4	33.33	1	8.34
Kotamadya U.Pandang	62	2	3.23	51	82.26	9	14.51
T o t a l	1,163	974	83.76	137	11.78	53	4.56

Source: Direktorat PMD, Klasifikasi Desa, 1975

- Explanation:
1. More than 55% of the population is engaged in agriculture.
  2. More than 55% of the population is engaged in industry and handicraft.
  3. More than 55% of the population is engaged in the service sector.

Table 5.24. Kecamatan Lokasi UDKP 1977/1978

No.	Kab/Kodya	Pembinaan	Pelaksanaan	Persiapan	Calon
1.	Bone	Sibulue	Ulaweng Tjangale	Iappariaja	Mara Genrana
2.	Luwu	Bone-bone	Bajo	Sabbang	Wara Malili
3.	Wajo	Sabbangparu	Sajoanging	Tansitolo	Belawa
4.	Polmas	Wonomulyo	Tinambung	Capalagiang	-
5.	Pinrang	Patamparua	-	Suppa	Mattiro- Bulu
6.	Tator	Sesean	Mangkendek	Sanggalangi	-
7.	Pangkep	Pangkajene	Sigeri Man- dalle	-	Bungoro
8.	U.Pandang	Bringkanaya	Tamalate	-	Panakukang
9.	Gowa	Tinggi - moncong	Pallangga	-	Bonto nom- po
10.	Bulukumba	Bulukumba	-	Bontotiro	Gangking
11.	Mamuju	Tappalang	-	-	Kaluku
12.	Enrekang	Alla	-	-	Baraka
13.	Sidrap	Baranti	-	Panca Ia- utang	-
14.	Soppeng	Marioriwawo	-	Marioriwawo	-
15.	Barrau	Soppeng riaja	-	-	Tanete - riaja
16.	Takalar	Galesong Selatan	Mangara - bombang	-	-
17.	Sinjai	Sinjai Selatan	-	-	Sinjai Barat
18.	Selayar	Bontomatene	-	Bontoharu	-
19.	Majene	Sendana	-	-	-
20.	Pare-Pare	Encukiki	-	-	-
21.	Maros	Bantimurung	-	-	-
22.	Jenepono	Bangkala	-	-	-
23.	Bantaeng	Tompobulu	-	-	-
		23 Kecamatan-s	10 Kecamatan-s	10 Kecamatan-s	14 Keo.

5.6.2. Transmigration

5066. The transmigration in South Sulawesi Province can be classified into two categories: the transmigration before Independence of Indonesia which is called as "the colonization" and the transmigration after Independence of Indonesia.

The colonization seemed to have a better condition than the transmigration does. The reason may be that colonization occurred in earlier time than transmigration, so that adaptation time is over now and only the development and maintenance time is left. It may be the better preparation of facilities and the proper sending of people in older times.

5067. Over-abundance of facilities and improper placement can induce social tensions with old inhabitants in the areas for the transmigration, as the transmigrants in the lead better life than the old inhabitants do. The other problems are the disturbance by hogs attacking new plants/crops, the shortage of market for production of secondary crops, and the problem for certification of lands.

5068. In the colonization areas, the shortage/limitation of lands for their (transmigrants in the areas of the colonization) children becomes the main problem; in new transmigration areas it is due to the arrival of new spontaneous transmigrants, for whom no similar facilities are available with adequate costs through the Ministry of Labor, transmigration and cooperative.

5069. List of resettled at the time arrival, resettled according to the provinces of origin and the list of the progress of transmigration activities, can be seen in the tables 5.25, 5.26 and 5.27. While the list of population increase of Kabupaten Luwu as the areas for the transmigration and the area of mining activities, which cause spontaneous population inflow can be seen in table 5.28.



Table : 5.25 Settled transmigrant (by origin) until 1976.

No. Transmigration Village unit	Area origin										Total	Re-mark				
	Jabar	D.K.I.	Jateng	J.I.Y.	Jatim	Bali	N.I.B.	per-hous-	per-hous-	per-hous-						
	hold	sons' hold	sons' hold	sons' hold	sons' hold	sons' hold	sons' hold	sons' hold	sons' hold	sons' hold	sons' hold	sons' hold				
1. Sidobinangun	-	-	100	462	-	150	656	-	-	-	250	1118				
2. Sidomakmur	-	-	-	-	-	75	339	175	790	-	250	1129				
3. Sukaraya	50	227	-	25	96	50	204	75	361	-	200	888				
4. Sukamaju	-	-	-	25	105	72	332	78	406	75	369	1212				
5. Sukadamai	-	-	-	50	337	50	171	50	300	100	478	1286				
6. Sidoraharjo	-	-	-	151	692	-	-	149	699	-	-	1391				
7. Mulyorejo I	100	416	100	354	200	1111	-	450	2178	150	689	5444				
8. Mulyorejo II	-	-	-	100	498	-	-	250	1075	-	-	1573	army			
9. Mulyorejo III	-	-	-	*50	304	-	-	100	495	69	407	1206	trans-			
10. Kertoraharjo I	-	-	-	48	286	-	-	100	503	352	1686	2475	mig -			
11. Kertoraharjo II	-	-	-	52	276	-	-	-	98	472	-	748	rant.			
12. Cendana Hitam	*50	335	*50	226	-	-	-	-	-	100	422	200	983			
13. Maramba I	-	-	-	100	454	-	-	-	-	150	754	250	1208			
14. Maramba II, III	-	-	*200	822	-	-	-	-	-	-	-	200	822			
15. Cendana Hijau	-	-	-	50	199	-	-	-	-	50	222	100	421			
16. Pepuro Utara	100	396	-	-	-	-	-	-	-	100	418	200	814			
17. C. Putih I	-	-	-	-	-	-	-	103	487	108	442	-	211	929		
18. C. Putih II	-	-	-	-	-	-	-	-	-	150	653	150	300	1297		
19. C. Putih III	107*	466	-	-	-	-	-	*43	201	150	704	-	300	1371		
T o t a l	407	1840	400	1706	901	4516	172	707	1623	7700	1447	6697	700	3149	5650	26315

Table : 5.26 Settled transmigrant (in arrived) until 1976.-

No.	Transmigration Villages unit	1970		1971		1972		1973		1974		1975		1976		T o t a l	
		hou- hold	per- sons	hou- hold	per- sons	hou- hold	per- sons	hou- hold	per- sons	hou- hold	per- sons	hou- hold	per- sons	hou- hold	per- sons	hou- hold	per- sons
1.	Sidobinangun	250	1118	-	-	-	-	-	-	-	-	-	-	-	-	250	1,118
2.	Sidomakmur	250	1129	-	-	-	-	-	-	-	-	-	-	-	-	250	1,129
3.	Sukaraya	-	-	200	888	-	-	-	-	-	-	-	-	-	-	200	888
4.	Sukamaju	-	-	250	1212	-	-	-	-	-	-	-	-	-	-	250	1,212
5.	Sukadamai	-	-	150	649	100	637	-	-	-	-	-	-	-	-	250	1,286
6.	Sidoraharjo	-	-	-	-	300	1391	-	-	-	-	-	-	-	-	300	1,391
7.	Mulyorejo I	-	-	-	-	-	-	650	3245	500	2199	-	-	-	-	1,150	5,444
8.	Mulyorejo II	-	-	-	-	-	-	76	341	274	1232	-	-	-	-	350	1,573
9.	Mulyorejo III	-	-	-	-	-	-	-	-	-	-	239	1206	-	-	239	1,206
10.	Kertoraharjo I	-	-	-	-	-	-	156	782	344	1693	-	-	-	-	500	2,475
11.	Kertoraharjo II	-	-	-	-	-	-	-	-	150	748	-	-	-	-	150	748
12.	Cendana Hitam	-	-	-	-	-	-	-	-	-	-	200	983	-	-	200	983
13.	Maramba I	-	-	-	-	-	-	99	524	151	684	-	-	-	-	250	1,208
14.	Maramba II & III	-	-	-	-	-	-	-	-	35	219	65	216	100	387	200	882
15.	Cendana Hijau	-	-	-	-	-	-	-	-	-	-	100	421	-	-	100	421
16.	Pcfuro Utara	-	-	-	-	-	-	-	-	-	-	200	814	-	-	200	814
17.	Cendana Putih I	-	-	-	-	-	-	-	-	211	929	-	-	-	-	211	929
18.	Cendana Putih II	-	-	-	-	-	-	-	-	150	653	150	644	-	-	300	1,297
19.	Cendana Putih III	-	-	-	-	-	-	-	-	-	-	150	667	150	704	300	1,371
T o t a l		500	2247	600	2749	400	2028	981	4892	1815	8357	1104	4951	250	1091	5,650	26,315

Table : 5.27 Condition of the transmigrator's increase in Kabupaten Ijau  
( Until 1976. 12 )

No.	Transmigrational Village unit	in arrived		decrease		increase		house- persons hold	house- persons hold		
		house- persons hold	house- persons hold	dead persons	house- persons hold	house- persons hold	house- persons hold				
1.	Sidohinangun	250	1,313	65	37	143	340	44	46	257	1,296
2.	Sidomampir	250	1,123	90	34	166	217	46	156	252	1,246
3.	Sukraya	200	883	62	15	51	242	34	88	219	1,105
4.	Sukmaju	250	1,212	89	4	36	315	73	207	324	1,609
5.	Sukadurai	250	1,286	49	5	29	182	46	71	291	1,461
6.	Sidoraharjo	300	1,391	35	13	55	140	50	80	337	1,521
7.	Mulyorejo I	1,150	5,444	121	112	345	220	94	173	1,152	5,371
8.	Mulyorejo II, III	589	2,779	50	29	140	121	72	135	632	2,845
9.	Kertoraharjo I	503	2,475	49	7	33	236	54	153	547	2,777
10.	Kertoraharjo II	150	748	27	3	15	85	30	122	177	913
11.	Cendana Hitam	200	983	17	5	25	45	14	58	209	1,044
12.	Maramba I	250	1,208	19	21	89	94	24	76	253	1,270
13.	Maramba II, III	200	822	6	6	57	11	7	197	201	961
14.	Cendana Hijau	100	421	7	-	-	41	8	24	108	479
15.	IB. Pepuro Utara	200	814	9	5	20	70	12	19	207	874
16.	Cendana Putih I	211	529	55	7	20	122	85	317	269	1,293
17.	Cendana Putih II	300	1,297	20	20	95	47	10	37	290	1,266
18.	Cendana Putih III	300	1,371	13	2	9	41	3	8	301	1,398
T o t a l		5,650	26,315	783	325	1,333	2,569	711	1,961	6,036	28,729

Table : 5.28 Developments in population of Kabupaten Luwu  
(1971 - 1976)

No. Kecamatan	Number of population in		Increase	
	1976	1971	Persons	% (1/1,000)
1. Larompong	13,621	11,343	2,187	19,127
2. S u l i	14,773	13,761	1,012	7,354
3. B a j o	32,836	27,802	5,034	0,181
4. Bastem	12,905	11,321	1,584	0,134
5. B u p a n	42,585	29,184	13,401	45,919
6. W a r a	49,646	45,584	4,062	8,911
7. Walenrang	63,799	56,853	6,946	12,217
8. Sabbang	26,156	21,785	4,371	20,064
9. Limbong	10,128	8,396	1,732	20,629
10. Malangke	14,535	12,736	1,799	14,125
11. Masamba	22,234	16,574	5,660	34,150
12. Bone-Bone	43,792	26,614	17,358	65,221
13. W o t u	18,795	12,667	6,128	48,378
14. Mangkutana	20,775	13,069	7,706	58,964
15. Malili	13,816	9,958	3,858	38,743
16. N u k a	19,064	8,194	10,870	132,658
T o t a l	419,640	325,980	395,922	

5.6.3. Resettlement

5070. This is different to transmigration, yet there are similarities like the movement of population to new settlement areas and the implementation by many agencies. As yet there are two kinds of resettlement, i.e. one is implemented by the Ministry of the Interior (by the P.M.D.), for instance in Kabupaten Sinjai, and the other is by the Ministry of Social Welfare, e.g. in Kabupaten Jeneponto. The difference among the two is not so apparent, except from the aspects of finance and facilities.

5071. The resettlement by the P.M.D. is very minimally financed; sometimes only a piece of uncultivated land and house-transferring facilities are given. The resettlement by the Ministry of Social Welfare has a better conditions since it has larger financial cost. Yet it is deficient when compared to the transmigration.

5072. In addition to that, another resettlement is planned, that which is implemented by the Ministry of Agriculture (by the General Directorate of Forestry). Which emphasizes on the population suffering from natural disaster; soluted community while the implemented by the P.M.D. emphasizes on the rearrangement of desa-s. Yet in fact no obvious difference is seen in the two concerning the mentioned above aims, for instance the resettlement implemented by the Ministry of Social Welfare in the Kabupaten Jeneponto, besides transferring population living in mountainous area, there is no difference between it and the resettlement by the P.M.D. in Kabupaten Sinjai.

Through these two resettlements have same aims, social facilities, from the point of view of social welfare, there is a great difference (see table 5.29).

5073. In Kabupaten Wajo there is evidently a kind of resettlement which is not implemented by any agency, but it occurs spontaneously, i.e. the movement of some people in Kabupaten Pangkep and Pinrang to the Kabupaten Wajo. This occurs due to the fact that the people of these two Kabupaten-s who have already experienced in brackish water fish ponds, view an economic Probability, more than other people/the old inhabitants do (see table 5.30).

Table 5.29 The condition of resettlement in Kabupaten Jeneponto and Sinjai

No.	I t e m s	Jeneponto	S i n j a i
1.	Executer	Ministry of Social Welfare	P.M.D.
2.	Areage of the project area		
	a) Plan (ha)	2,000	1,000
	b) Existing (ha)	595	218
3.	Settler		
	a) Plan (families)	250	500
	b) Existing (ditto)	200	109
4.	Financing (Rp)	74,675,000	21,570,000
5.	Facilities have prepared		
	a) shelter/house	1/famili	(only financial aid)
	b) L a n d	1.5 ha/farm	2 ha/farm
	c) livestock	4 cows/10 farm	-
	d) policlinic	1/project site	1/project site
	e) public well	74	2
	f) W.C.	26	-
	g) primary school	1	-
	h) stuff *	(for the 9 months)	-

Note: \* Stuffs consists of rice, dried fishes, kerosene, coconut oil, sugar and salt.

Source: 1) Governmental Office of Jeneponto and Project Site Office.  
2) Governmental Office of Sinjai and P.M.D. Office of Sinjai.

Table 5.30 Spontaneous resettlement in Kabupaten Wajo (1977)

No.	In Desa/Kecamatan	Number (owner of fish pond)	Original Kabupaten
1.	Akbujung/Sajoanging	36	Pangkep
		16	Pinrang
	Sub-total	52	
2.	Akkotungeng/Sajoanging	270	Pangkep
		80	Pinrang
	Sub-total	350	
	T o t a l	402	

Source: By the study of the Team

5.7. Needs of farmers

5.7.1. Definitions of Farmers

5074. In South Sulawesi Province, farmers are not so homogeneous that it is difficult to make a sweeping statement. Among those people involved in farming, absentee land lords, land owners, tenants and landless workers are generally known. The activities regional agriculture development planning have to make clear the focus for whom poors shall be the first priority.

5075. The number of household of landless workers reaches 270,835 occupying 29.4% of the total farm household and small holders less than 0.5 ha. is 180,506 occupying 19.7% of the total farm households. The two classes mentioned above occupy about a half (49.1%) of the total farm households. Since they do not have any marketable surplus rice, they have no interest about the floor price of rice and also about technical development such as Bimas/Inmas. However, they may have strong desire to gain land on which they can build their stabilized livelihood continuously as the land owners.

5076. Among sea fishery desa-s the conditions are more difficult and complex, 1) and fish pond owners and laborers are in quite different socio-economic conditions in the brackish water fish pond area. There are 36,675 full-time and 9,184 part-time fishermen households and 174,000 laborers including sea catchmen, fish pond and fresh water fishery workers in 1975. The number of boats is 37,200 in total. These figures indicate that about 79% are miserable fishing laborers.

---

Note: 1) According to the Interim Report (Vol.III) of the Team of SRDS, many sea fishermen in the Province do not own their own boats but rent them from a boat owner for a proportion of usually 50% of the catch. Often lines, nets and other equipments, as well as food are also obtained from the boat owner, again for a proportion of the catch. What is more, fish usually have to be sold to the boat owner who then market the fish. The buying price by the boat owner is usually much lower than the market price. The result is that many fishermen receive as little as 10 to 20% of the value of their catch. (continued to the next page). (continue to the next page).

5.7.2. Reclamation investment

5077. Reclamation and resettlement policy should be given more attention and priority among the government agencies, not only in the South Sulawesi Province but in the Central Government for the development of such majority of the poor. It is recommended that the policy of transmigration of Javanese people to outside islands and resettlement in the Province should be integrated and promoted giving the same financial support and investments.

5078. Fortunately, in South Sulawesi Province, and along the seashore of the Province, there are, even though they are scattered owing to the topographical conditions, plenty of area suitable for reclamation of cultivation lands and fish ponds. In addition, there are many outmigration people seeking for agricultural lands and also spontaneous movements of fishery farmers from Kabupaten Pangkep and Pinrang to Kabupaten Wajo (Kecamatan Sajoanging), and Tempe Lake fishery laborers to the brackish water fish ponds in the same Kecamatan area already under going. In the sea reclamation, a new technical development way will increase the production even in the old fish ponds by an additional infrastructure investments are quite important and effective in the brackish water fish pond areas, too.

---

Note: 1), (continued from page 109)

With increase so low, many are continuously in debt to the boat owner and are kept in a form of perpetual economic serfdom. In the sea fishery economic structure, it appears that upgrading of boat, equipments, or physical marketing facilities will not necessarily bring about an improvement in the income and economic well being of the province's fishermen. The people to make profits are most likely to be boat owners. Conversely the way is to ensure success in modernizing the fishery industry is to ensure that fishermen themselves are economically independent and receiving at just reward for their labors so they can participate wholeheartedly in the modernization program. The way is not easy but to make first steady step by the strengthening of KUD of fishermen. The result of the survey by the Team of ATA-140 is also the same conditions in the fishery Desa-s.



5.7.3. Marketing system development

1) Marketing of rice

5079. As described in 5.7.1. half of the farm households have same marketable surplus in their farming. Rice is the main crop in South Sulawesi Province, however, DOLOG purchases only 5 % of total production. Since 70% of total production is for self consumption and 10% reserved in their farming as seeds, other storage and losses, 15 % of total products will be in the market by the middlement.

This aspect of rice marketing and upgrading of rice quality are the most fundamental for the farmers who have marketable surplus.

5080. However, most of rice sold is from the middle income and rich farmers groups who own at least one hectare of land, and bulk of this comes from land-lords who may own 5 to 10 hectare. Moreover, it should be noted that about 60% of all rice farmers are share-croppers and half of the production pay for land-owner as land rent. Consequently, the farmers who have the marketable surplus of rice are rich in general and they have enough ability to get credit and to organize a self-reliance organization for the rice marketing. It is considered that government involving is not so necessary for the marketing of this aspect.

2) Marketing of other commodities

5081. There are many systems for the shipment of agricultural products in the producing area. However, almost all system are doing the business not in collectively but between each farmer and middlemen separately. Consequently scarce profits are shared for farmers and sometimes preharvest transaction are seen indicating the poverty of farmers.

5082. Especially in the remote distance areas such as Kabupaten Enrekang, middlemen sometimes do not come to local market even in the market day of twice a week.

Although farmers conveyed the cabbages and other vegetables on horsebacks from the mountainside desa-s, those harvested production are destroyed in vain.

5083. The function of BUUD/KUD for rice purchasing by the government is to be expanded for other commodities.

That is to say BUUD/KUD has to work for the collection of commodities and after that price negotiation should be done with middlemen by the BUUD/KUD.

5084. After accomplishing some expansion of functions in BUUD/KUD, there will be a necessity to build up a set of facilities. The plan mentioned above has to be decided based on the real needs of the farmers in the production areas.

5085. On the other hand, in the consumption area, there will be a necessity and availability to make plans on demands and supplies after deciding the delivery systems in the consumption area and the collection and shipment systems in the production area. Each consumption area has to decide necessary amounts of demands by commodities by month. At the same time each production area must make plans for cultivating by commodity by month.

5086. Then the conference will be held among the consumption areas and production areas to reach the conclusion on the demand and supply plans based on the plans brought by respective area. The production areas have to estimate the amount of production and shipment and then the consumptive areas must have an adjustment for the amounts and the arrival period by commodity so as to maintain adequate prices.

5087. The new work shall be the responsibility of the Provincial Government, because it is a policy and implementation for expanded area beyond the border of Kabupaten-s Governments.

5.7.4. Opinions of Bupati-s of specific Kabupaten-s

5088. The Team of \_\_\_\_\_ often visited the specific Kabupaten-s Jeneponto and Enrekang in order to get common recognitions and acknowledgements among Team members through the case study training on several problems and aspect. At the same time the Team has studied the outline of implementable plans which should be more deeply studied on a pre-feasibility study for the implementable plans in next phase.

5089. Since those areas are so critical that more specific study should be done by various kinds of specialists.

In addition, it is foreseen that the introduction of new commodities and new technique might be necessary. Therefore, before the commencement of the implementation of development plans some demonstration pilot tests are requested by the Bupati-s of both Kabupatens respectively.

5090. It is quite reasonable from the responsible from the responsible position as the Bupati to examine more precisely and prudently through the demonstration as the pilot tests which may be the most suitable way of technical training and education for the officials concerned and of involv-

ing the farmers.

The opinions presented by the Bupati-s at the end of 1977 summarized by Co-manager of the ATA-140 Project are as follows:

1) The opinions of Jenepono's Bupati

5091. i) We are expecting the Team of ATA-140 Project to solve and improve:
- a) the problem of deficiency of water,
  - b) the problem of the critical situation of soil, and
  - c) the problem in organizing the farmers.
- The three kinds of problems are below normal condition that will interrupt the agricultural development in Jenepono.
5092. ii) It is necessary that the Team should carry out demonstration on pilot tests in the form of:
- a) Demonstration of the effective and efficient use of irrigation water, so that the acreage of irrigated paddy fields will be expanded, especially in the areas where the paddy fields always have deficiency of water in the wet season. (this will certainly need a better net system of irrigation ditches with a well organized farmers water use).
  - b) Demonstration of effective and efficient use of Kelara Irrigation water for paddy and other crops.
  - c) Demonstration of the using ground water for the irrigation of crops, especially citrus in the dry season by equipment and modern technology.
  - d) Demonstration of soil conservation and production increasing of the critical lands.
  - e) Demonstration of kinds of crops in order to know, which is suitable to be promoted on critical lands and which one on the location of forestation and greening.
  - f) Demonstration of production increasing and productivity of shrimps in fish ponds.
  - g) Demonstration of organized marketing starting from the time of harvesting to the selling of the production.
  - h) Demonstration of improved supply of drink water, washing and bathing for the desa's people who have difficulties in water.

5093. iii) Certainly there are already many problems identified by the Team, because Jeneponto has been visited many times by the Team. Therefore, the Team should know better what kinds of activities are essential to be carried out as demonstration activities before the implementation of the project. We are suggesting in solving problems to be discussed with the High Education Institution such as University of Hasanudin. Additional input in the field of socio-economic will be observed, so that the analyzed results will be more suitable to the analyzed results that have ever been observed by the scientific institutions.

5094. iv) The pilot demonstration activities we propose above are considered to be preparations for the implementation of the project which are very necessary in relation with the activities of agricultural development planning in the Kabupaten of Jeneponto.

2) The opinions of Kabupaten Enrekang's Bupati

5095. i) We are expecting the Team of ATA-140 Project to solve and improve:

- a) the problem of marketing and processing of the following production: Vegetables (cabbage, chinese, and palm sugar.
- b) the problem of critical agricultural land conditions by the use of equipments and modern technology.
- c) the problem of agricultural development by planting commodities which are suitable to the regional condition in order to obtain more beneficial income, because by solving the problem it will support to increase the farmers income obtained from the benefit of the agricultural development in Kabupaten Enrekang.

5096. ii) It is necessary that the Team should carry out a demonstration pilot test in the form of:

- a) demonstration of vegetable storage methods (cabbage, chinese cabbage, potatoes etc) as far as the vegetables cannot be sold yet after harvesting.

- b) demonstration of palm sugar processing methods without the use of fire wood, in order to decrease the use of fire wood, because monthly 100 tons of palm sugar can be produced, and the demonstration of storage methods as long as the product is not sold yet.
  - c) demonstration of introduction of new commodities which are suitable with the agriculture of condition in the region which is more beneficial in comparing with the traditional commodities.
  - d) demonstration of the use of modern equipments for the development of agriculture.
  - e) demonstration of pastures for cattle on sloping area.
  - f) demonstration of new species of tree and modern technology which is suitable to promote on the location reforestation and greening.
5097. iii) It is necessary to be considered by the Team for:
- a) The canning of salacca fruit and making of papaya's juice to support the development of wellmanaged salacca and papaya estates and to increase the farmers and region income, because the monthly average of production of salacca is 300 - 330 tons.
  - b) The construction of new paddy fields from new rural irrigation construction for the development of resettlement efforts.

6. Marketing and transportation service for Agriculture

6.1. Marketing of farm products

6.1.1. The relation of city and villages in South Sulawesi Province

6001. Having the reviews on the relation of cities and village, following these types of classification would be meaningful.

a) The first type is the big or medium "cities" where majority of farm commodities come from not only surrounding villages, but also from remote areas including foreign countries.

b) The second type is the small "cities" where majority of farm commodities come from surrounding villages and a few specific and expensive commodities, i.e. vegetables and fruit come from remote areas through the markets in the first type cities.

c) The third type is the small "cities"/the large villages where each farm commodities come from only within or near the villages.

6002. Kotamadya-s Ujung Pandang and Pare-Pare only belong to the first category in the Province and the following six "cities" such as, Watampone in Kabupaten Bone, Polmas in Kabupaten Polewali Mamasa, Palopo in Kab. Luwu, Sinjai in Kabupaten Sinjai, Pangkajene in Kabupaten Pangkep, Sungguminasa in Kabupaten Gowa are included, in the second type of cities <sup>1)</sup>. And then the third type of cities are able to be found out in the center of other Kabupatens.

6003. The marketing routes for the selected commodities and the concerned areas with each type of city can be shown as table 6.1. The improvement of marketing systems would promote a regional agricultural development in the second type of city, because the transportation of farm products produced there and other kinds of goods depend a great deal upon the transportation means. However, if the marketing improvement plans were formulated, agricultural producing should be formulated at the same time.

6004. Group of commodity for agricultural products in South Sulawesi Province are distributed as follows, and each group has each marketing route to 3 types of city as mentioned above.

---

1) These cities have many trucks and pick-ups (more than 100).

a) Food Crops

- i) Rice.
- ii) Processing of drying the products such as corn, cassava, onion, green gram, peanut,
- iii) Commodities produced in plain area such as tomato, Eggplant,
- iv) Commodities stocked a few days such as pumpkin, potato, sweet potato, papaya, banana, salacca,
- v) Citrus fruits, this is produced in specific area, i.e. kabupaten Jeneponto and Selayar and.
- vi) Commodities of import and interinsular trade such as apple, sunkist orange.

b) Estate Crops

- i) Coconut, coffee, these commodities also is food stuffs,
- ii) Markisa, sugar cane, these commodities have processing factories in the Province,
- iii) Kapok, tobacco, these commodities are mainly for interinsular and,
- iv) Coffee, nutmeg, other commodities for export.

c) Fisheries products

- i) Commodities of inland fish captured such as carp etc,
- ii) Commodities of brackish water fish cultured such as milkfish, etc,
- iii) Commodities of sea fish,
- iv) Commodities of drying fish, and
- v) Shrimp and flying fish for export.

d) Livestock Products

- i) Commodities of big or middle animal such as cattle, buffalow, goat,
- ii) Commodities of small animal such as duck,
- iii) Horses and pigs, these are eaten in specific area in the Province, and
- iv) Milk and eggs.

e) Input commodity

- i) Commodities for using food crops and estate crops,
- ii) Commodities for using fishing culture, and
- iii) Commodities for using livestock.

Table 6.1. Routes of farm products by commodities for each region

No.	Commodities	Ujung Pandang and Pare-Pare (1st type)
1.	Rice/paddy	all rice/paddy come from almost all regions in South Sulawesi
2.	(processing commodities)	ditto.
3.	(produced in plain areas)	from neighboring Kab. Takalar, Gowa, Maros/Pinrang, Sidrap and Enrekang.
4.	(possible to transport)	almost all regions all seasons except Kab. Majene, Luwu, Selayar and Mamuju.
5.	(produced in high land areas)	from Kab. Jeneponto, Gowa, Enrekang at all season, from Kab. Sinjai at season.
6.	(tropic fruit)	the same as (4)
7.	(citrus fruits)	from Kab. Jeneponto and Selayar
8.	(import and inter-island)	from Java island, Australia, Taiwan and other regions.
9.	(estate crops)	from almost all region export commodities through this cities.
10.	(livestock)	ditto
11.	(fishery products)	from Kab. Pangkep, Takalar, Jeneponto, Pinrang and Barru.

(Continue)



Table 6.1. Routes of farm products by commodities for each region

(continued)

No.	Watampone and Polmas. etc (2nd type)	Other small cities/range Desa-s (3rd type)
1.	almost all come from neighboring a little come from far off	come from only neighboring (include near kabupaten)
2.	-ditto-, and Kab. Wajo, Sidrap/ Kab. Wator, Wajo	-ditto- (a little include other kabupaten area)
3.	-ditto-	-ditto-
4.	-ditto-	-ditto-
5.	from Kab. Binjai, Jeneponto/ Marekang, Wator at all season	almost in each kabupaten at all season a little from near Kabupaten
6.	almost in each Kabupaten all season a little from near Kabupaten	only in Kabupaten
7.	through Ujung Pandang, Pare- Pare from Kab. Jeneponto and Selayar	a little from Kab. Selayar
8.	a little through Ujung Pandang	come a little
9.	from only neighboring export commodities collecting here	from only neighboring
10.	-ditto-	-ditto-
11.	-ditto-	ditto, except inside area Kab. Wator, Marekang, Soppeng.

6.1.2. Distribution of supply area and shortage demand area by commodity

6005. Distribution of producing area of farm products in South Sulawesi Province is shown in table 6.2. Using following indicators, XX (two X) means 0.5 unit, i.e. in the case of commodity peanut. The mark of X (one X) in kabupaten Luwu means to be scarce, the mark of XX (two X) in Kab. Enrekang means enough to consumption in this Kabupaten. And the mark of XXX (three X) in Kab. Soppeng is showing that surplus of one X had existed in the Kabupaten in 1976.

An equation of calculation X is as follows:

$$X = \frac{\text{Volume of farm production per capita by Kabupaten}}{(\text{Total volume of farm production} - \text{Volume of export } 1)} + \frac{(\text{Total population in South Sulawesi})}{2}$$

Mark	X = 0.3 - 0.7
	XX = 0.8 - 1.2
	XXX = 1.3 - 1.7
	.
	.
	.

Note: The volume of export was taken away from total volume, because other factors are not available in this time.

6006. For instance, in case of livestock in both area Luwu and Pare Pare there are one shortage of X and two of it in Ujung Pandang. On the other hand there are four surplus of X in Tator, however, probably their surplus meats in Tator may have been transported to Pare-Pare and Ujung Pandang, because to they are almost all pork. Especially consumers in Ujung Pandang who have pure buying power may have bought more meat than consumers in Pare-Pare. Consumers in Luwu may have bought it from other Kabupaten. In general, consumers in rural area have bought shortage commodities, they have eaten other foods such as fishes and peanut in South Sulawesi Province, particularly in Kabupaten Pinrang and Majene. This table 6.2. shows that there are surplus of two commodities only, vegetables and fruit, other commodities of main food stuffs are in shortage, but farmers in the rural area probably would be able to get the main food stuffs with some money which is obtained by farmers selling vegetables and fruit to other areas.

1) The analysis of collected data by the Farm Practice Survey have not been finished yet, therefore this is an estimation but not a conclusion.

Table 6.2. Estimation of supply area and area of shortage (1976)

Commodity	Rice/Corn Cassava	Peanuts	Green beans/ Soy beans	Vegetables	Bananas
LWU 01	XX	X	XX	X	XX
TAT 02	XX			XXX	
SOP 03	XXX	XXXXX	XXXXXXXXX	XX	XXXXXXXXX
WAJ 04	XX		XXXXX	XXX	XXXXX
BON 05	X	XXXX	X		X
SIN 06	XX	XXXXXXXXXX		XX	
BUL 07	XX	XXXX		X	
SEL 08	XX	X	X		X
BAN 09	XX	X		XXX	
JEN 10	XX	X	XXXXX XXXXX	XXX	XXXXX XXXXX
TAK 11	X		XXXXX	XXXX	XXXXX
GOW 12	XX		XXX	XX	XXX
U.P 13					
MAR 14	XXXX			X	
PAN 15	XXX	X	XXX	X	XXX
BAR 16	XX	XXXXX XXXXX XX	X	XX	X
P.P 17				X	
SID 18	XXXXXXXX			XX	
ENR 19	X	XX	X	XXXXXXXXXX XXXXXXXXXX XXX	X
PIN 20	XXX		XX	X	XX
POL 21	X			X	
MAJ 22	X	X	XX	XXXXX	XX
MAM 23	X	XX	XXXXXXXXX		XXXXXXXXX

Source: Refer to Volume III

(continue)

Table 6.2. Estimation of supply area and area of shortage (1976)  
(continued)

	Fruit		Coconut	Coffee	Livestocks	Fishes
01	XX	XX	XXXXX	XXXXX	X	XX
02				XXXXX	XXXXXX	
03		XXX	XX		XX	X
04	XXXXXXXX	X	XXXX		XXX	XX
05			XX		X	X
06			XXX	XXXX	XXXX	XXX
07	XXXXX	X	XXXXX	XXXXX XXXXX	X	XXX
08	X	XX	XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX XXXXXXXXXX		X	XX
09		XX	X	XXXXXXXXXX XX	XX	XXX
10		XXXXXX	XXX		X	X
11	XXXXX	X	X		XX	XXXXXX
12	X	XX		XXX	XX	
13		X				XX
14	XXXX	X			XX	XXXX
15	X	X	XXXXX		XX	XXXX
16	X	X	X		XXX	XXX
17			X		X	XXXXXXXX
18	XXX	XX	XXX		XX	
19		XXXXXX	X	XXXXXXXXXX	XX	
20	XXX	XX	XXXXXXXXXX	X	X	XXXX
21	XX	XXXXX	XXXXXXXXXX	XXXXXXXXXX	X	XX
22	XXXXX XXXXX XXXXX X	XX	XXXXXXXXXX XXXXXXXXXX	XX	X	XXXX
23	XX	XXXX	XXXXXXXXXX XXXXXXXXXX XXXXXX	XXX	XX	XXX

6007. There is no farm products in Ujung Pandang and Pare-Pare, in addition, consumers there get some income from non-agricultural industries, already it is said to be the consuming cities. Table 6.2 shows the situation of only one year 1976, consequently the data are different from general information that Kabupaten-s Takalar and Gowa have enough food stuff and then Wajo has sometime much surplus of it. This will be clear in the following table 6.3 and figure 6.1.

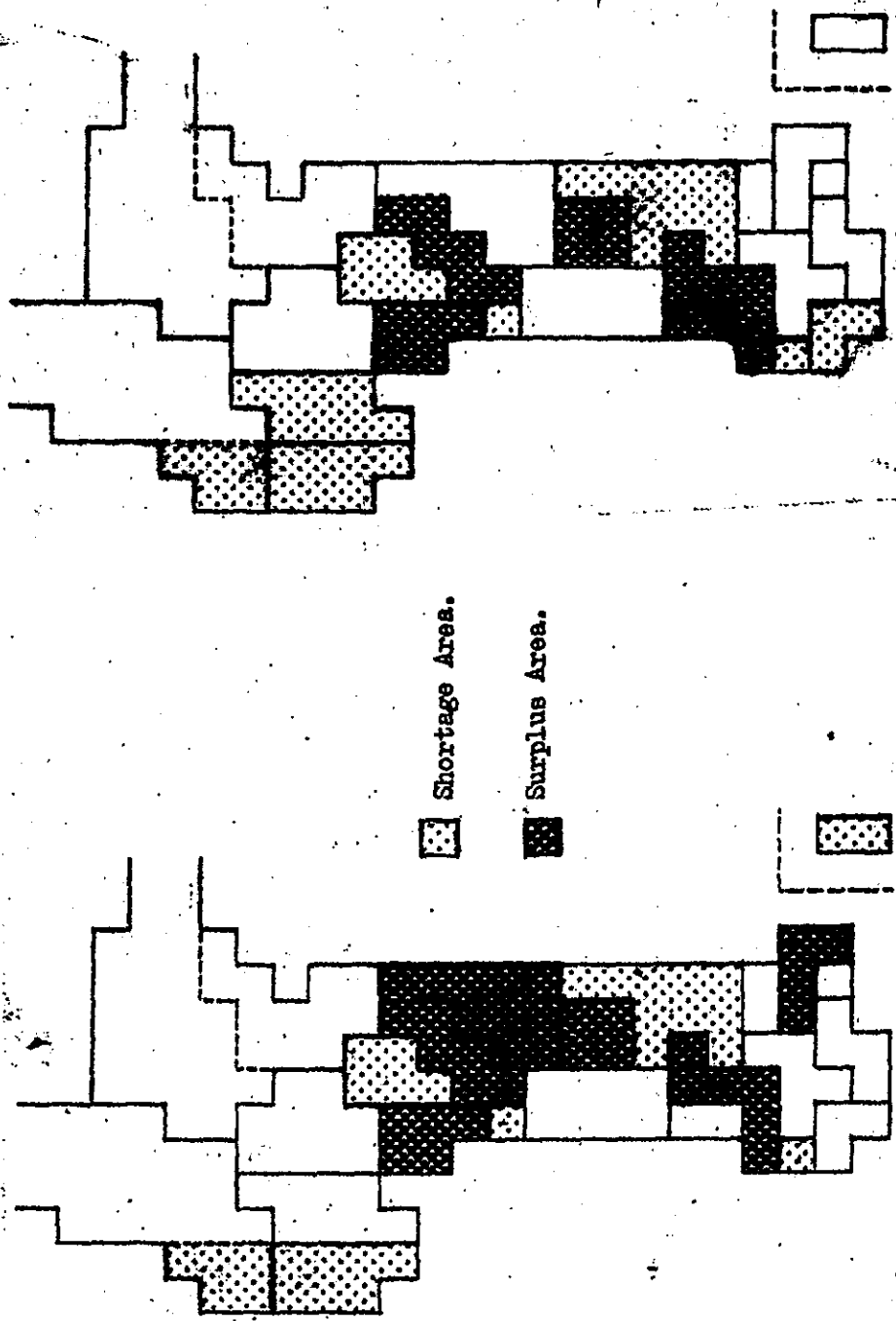
Table 6.3. Estimation of supply area and shortage area of major food  
(1974 - 1976)

No. Kab.	1974	1975	1976	Average
1. LUN.	XX	XX	XX	XX
2. TAP.	XX	XX	XX	XX
3. SOP.	XXX	XXX	XXX	XXX
4. WAJ.	XXX	XXXX	XX	XXX
5. BON.	X	XX	X	X
6. SIN.	XX	XX	XX	XX
7. BUL.	XXX	XXX	XX	XXX
8. SEL.	X	X	XX	X
9. BAN.	XX	XX	XX	XX
10. JEN.	XX	XX	XX	XX
11. TAK.	XXX	XX	X	XX
12. GOW.	XXX	XX	XX	XX
13. U.P.				
14. MAR.	XXX	XXX	XXXX	XXX
15. PAN.	XX	XX	XXX	XX
16. BAR.	X	XX	XX	XX
17. P.P.	X			
18. SID.	XXX	XXX	XXXXXX	XXXX
19. ENR.	X	X	X	X
20. PIN.	XXXX	XXXX	XXXX	XXXX
21. POL.	XX	X	X	XX
22. MAJ.	X	X	X	X
23. MAM.	XX		X	X

Sources: Refer to Volume III: . . .

Fig. 6.1.1. Shortage and Surplus Area  
Main Food Stuffs 1974-76 (Average)

Fig. 6.1.2. Shortage and Surplus Area  
Main Food Stuffs 1976



Source: Refer to II.1. of Vol. III and Table 6.3.

Note: by average of 1974-76.

Fig. 6.1.3.

Shortage area and surplus area  
for vegetable & potato

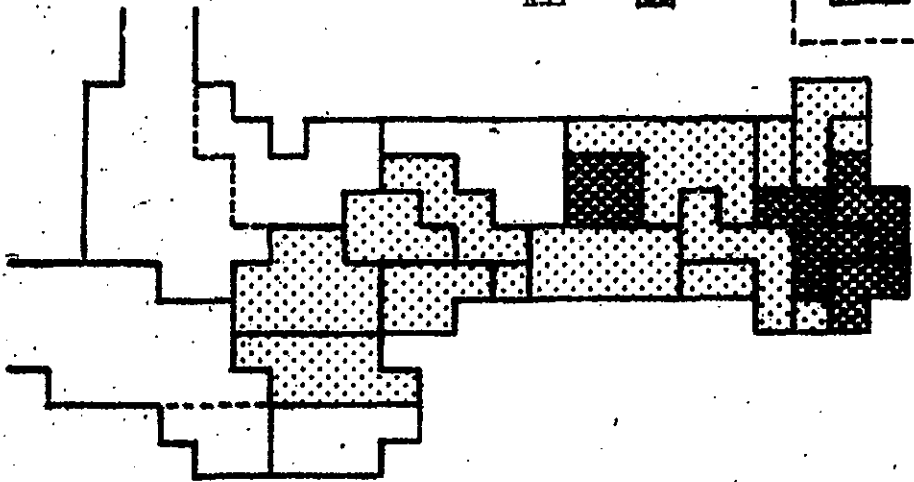


Fig. 6.1.4.

Shortage area and surplus area  
for vegetable

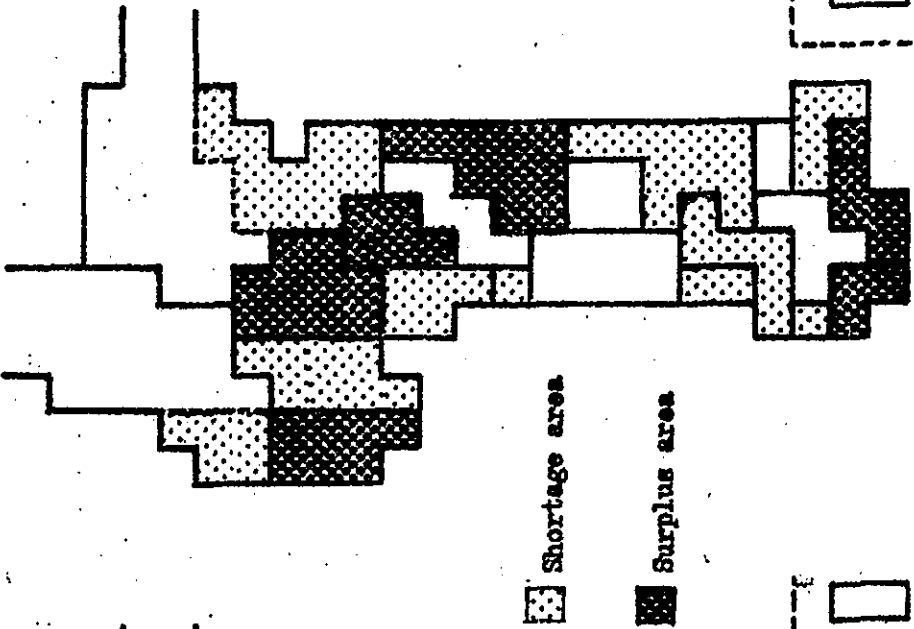
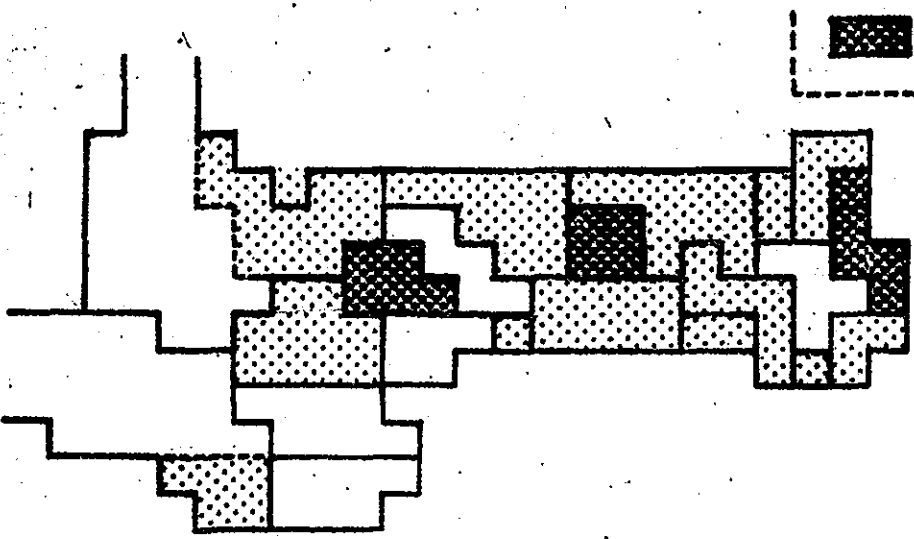


Fig. 6.1.5.

Shortage area and surplus area  
for fruit



Source: Refer to II.1.1-4. of Vol. III.

6.1.3. Monthly supply of main food stuffs

6008. Comparison with gross yielding and estimated net consumption <sup>1)</sup> is shown in Fig. 6.2. In the case of formulation agricultural development plans, the following subjects are very important to study:

- i) How to preserve the commodity during a term of produced surplus, and
- ii) How to distribute and how to transport during a shortage term.

6009. For instance, in case of rice as shown in fig. 6.2, though short volume (gross yielding - net consumption) of rice was about 140 thousand tons during 5 months, October 1974 to February 1975. before that there were surplus of rice about 140 thousand tons during 3 months from June to September, therefore when their surplus had been preserved for regional consumers, balance of the supply and demand could be kept, but there are many stock loss, transportation loss, and processing loss, but inter-insular trade of rice exist in 1975, maybe regional consumption was made in South Sulawesi Province.

Figure 6.2 has some errors like that, however the term of shortage and of surplus is made clear in the same figure, i.e. commonly the term of shortage of rice is from November, in South Sulawesi Province.

6010. In the province most commodity except rice do not have systematic stock system at present. Particularly to preserve cassava and corn depend farmers' thought in spite of they are necessary for export and interinsular trade. Almost all surplus of these commodities is preserved in farmers houses. Unfortunately if they are not sold, farmer is deprived of thought of producing them.

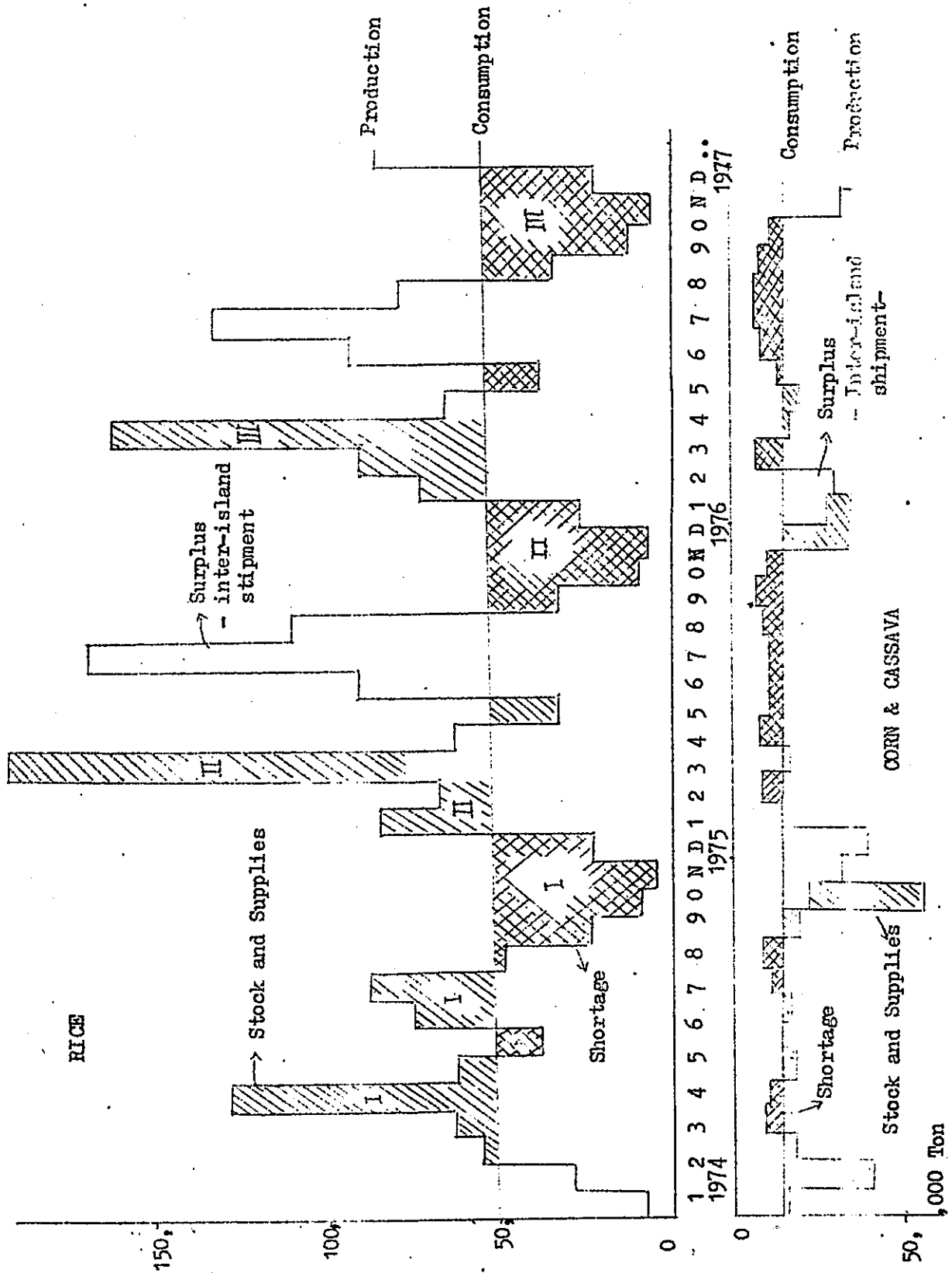
6011. The concern of this Province, though they had tried to increase corn and cassava due to export, farmer did not produce them always more than before. In future the stock systems for these commodities should be improved from dependence on farmer.

---

1) Volume of consumption of rice = population x 116 Kg/capita  
x 30 days/month



Fig. 6.2. Condition of monthly supply of main food stuffs  
in South Sulawesi (1974 - 1977. Feb.)



Source : Laporan Pertanian 1974, 1975 and 1976.

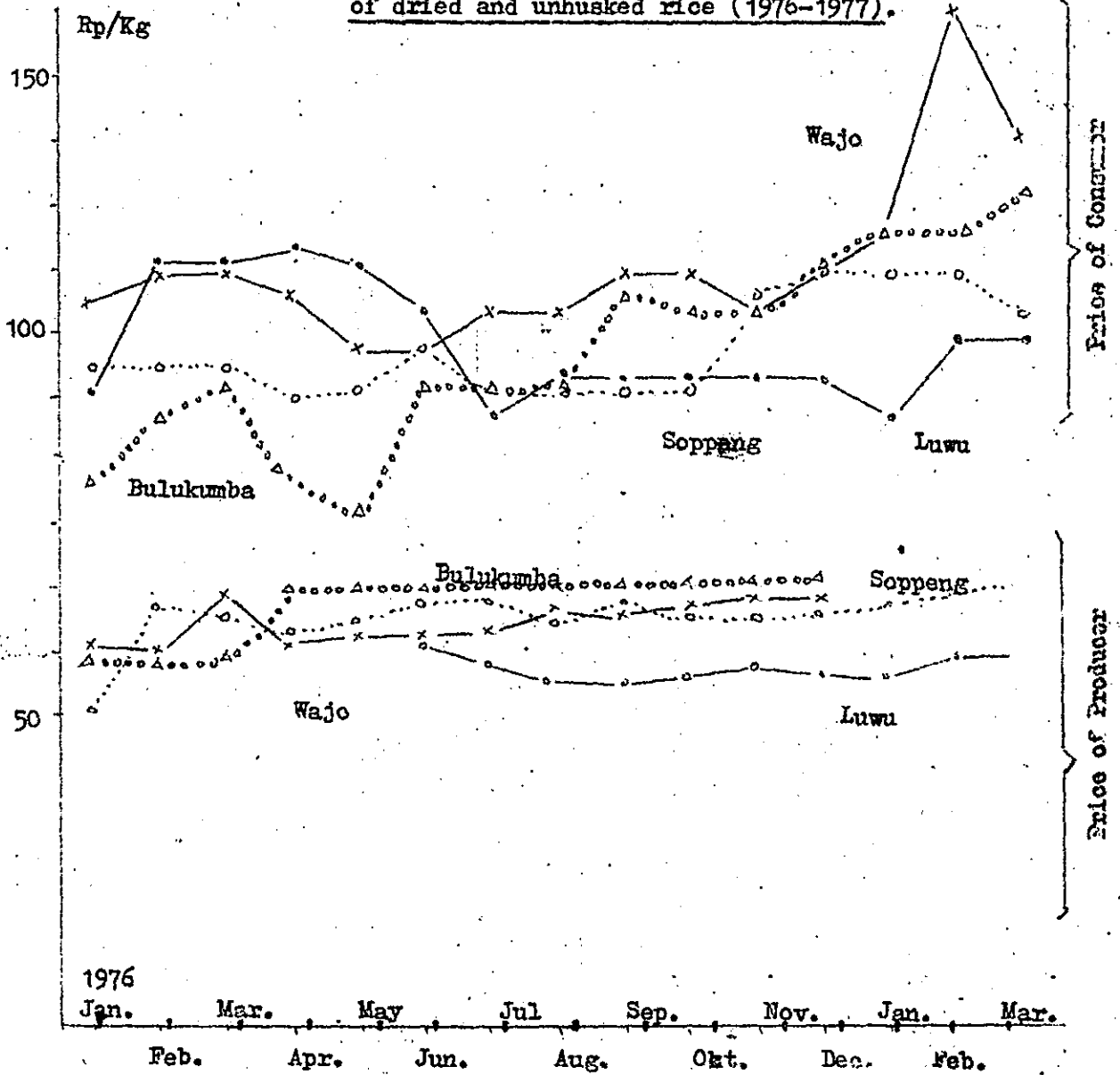
6.1.4. Movement of prices for farm products

6012. The fluctuation of prices for farm products are larger than that of non-farm products, and commonly the fluctuation for farmers are less than that for consumers as shown figure 6.3. In South Sulawesi Province particularly condition of transportation system between rural area and urban area is very poor, and the frequency is a little. Under the condition, to keep the stable balance of supply and demand is very difficult, there are poor stocking system in each city in the Province. Therefore there are large differences of the price of farm products by month and by Kabupaten as shown in figure 6.4, 6.5 and 6.6.

6013. These data are showing further consideration, i.e. price of tomatoes in Ujung Pandang in December 1976 is 4.5 times that of Kabupaten Unrekang even corn in main food stuffs has 1.5 times of difference of the price in Pare-Pare with Kabupaten Wajo in September. The farmer is caused by the problem of the supply and demand and then is due to very bad natural condition in the wet season. The latter is estimated to be the over supply by the reason of poor communication to Pare-Pare from surrounded areas such as Kabupaten Wajo and Bone.

6014. Estate crops have also large fluctuation by Kabupaten, i.e. average prices of coconut in 1973 are Rp. 17 in Kabupaten Luwu and Rp. 68 in Bone, and they are Rp. 140 and Rp. 55 in each Kabupaten in 1974 they are Rp. 21 and Rp. 25 in 1974. On the other hand livestock commodity and fish commodity has comparatively low fluctuation than other food crops and estate crops. The fact mentioned above are very important condition, but in any case there are many fluctuation of the prices and the cause is not simple but complicated. On the following article 6.1.5. this item was studied based on the results of field survey and data analyses.

Fig. 6.3. Consumer price of rice and Producer price of dried and unhusked rice (1976-1977).



Source: Refer to Volume III.

Fig. 6.4. Price fluctuation of rice by Kabupaten (1976)

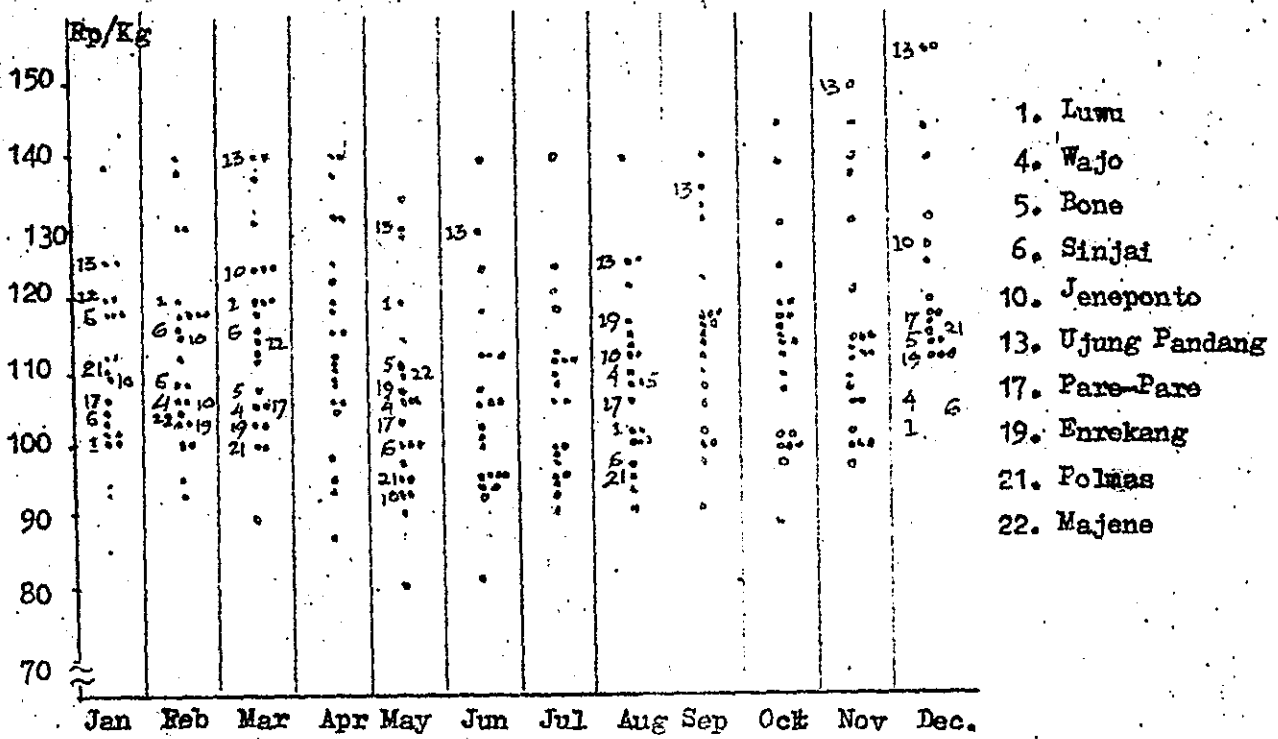
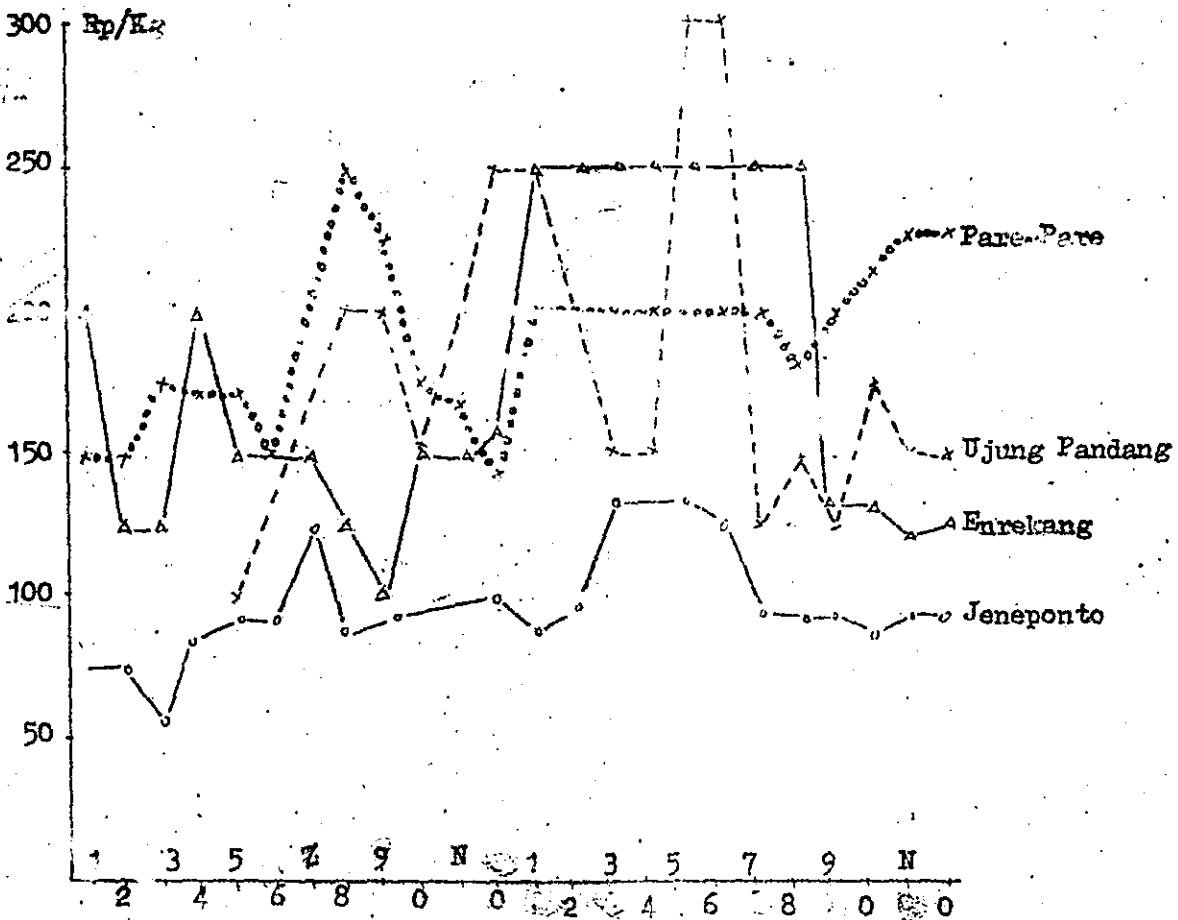
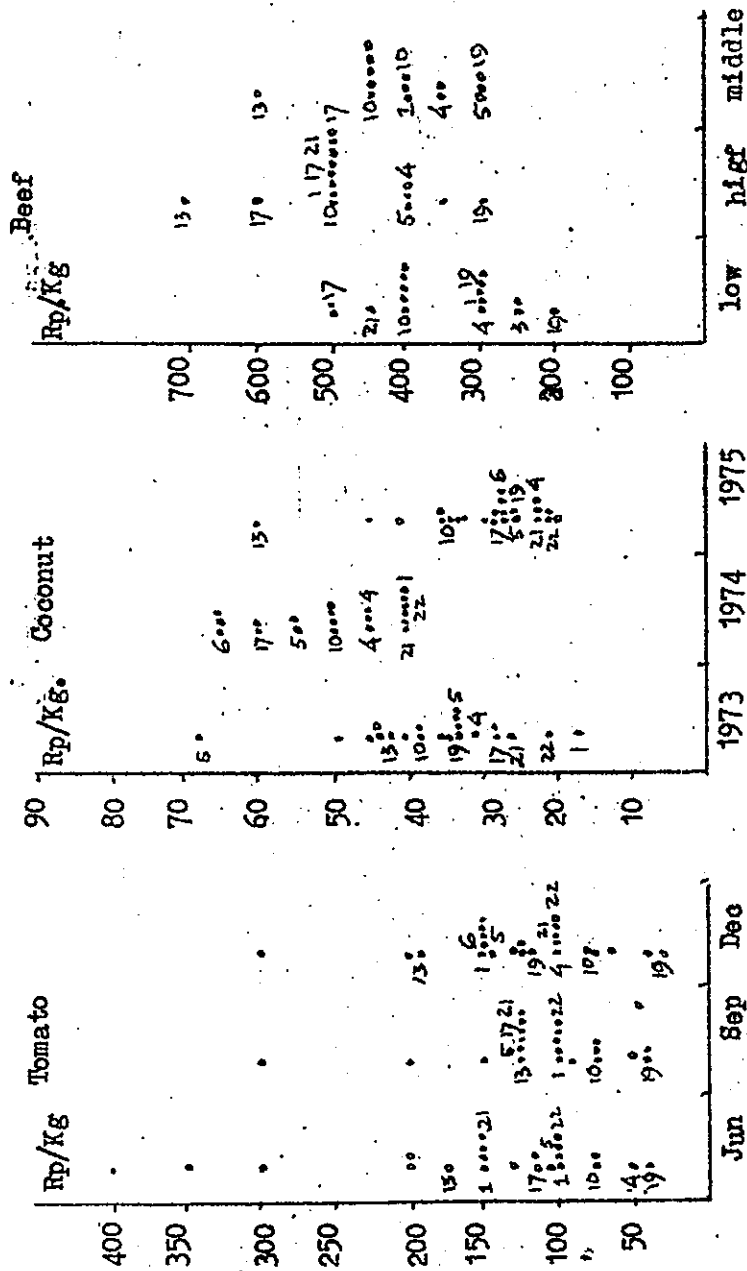


Fig. 6.5. Price fluctuation of onion by Kabupaten (1975-1976)



**Fig. 6.6. Difference of Price of Tomato, Coconut and Beef (1973/1975)**



- |          |                   |               |            |
|----------|-------------------|---------------|------------|
| 1. Inuvu | 6. Sinjal         | 17. Pare-pare | 22. Majene |
| 4. Wajo  | 10. Jeneponto     | 19. Enrekang  |            |
| 5. Bone  | 13. Ujung Pandang | 21. Polmas    |            |

6.1.5. Systematic problems on the agricultural marketing

6015. The primary objective of marketing improvement is that the prices at farm level and at the market level should be stabilized and the amount of input materials should be enough to keep agricultural production. Stabilization at the low price level makes the production stagnate. The high price level constrain the demand. Thus these drastic fluctuation of price make the agricultural development retard. The secondary objective is value added. Both farmers and traders should share benefit based on their contribution. As the strategy for the farmer, the agricultural output will be stabilized by taking various means to fit the productive conditions for instance, regulation of producing, infrastructure such as irrigation system and land improvement. As the strategy for the measures mentioned above, traditional marketing system should be changed into a rational and modern one. This could bring a reasonable profit for the farmers. As the strategy for the latter, the adjustment of marketing volume by the stock of production in the regional and export import will be deliberated as a countermeasure.

6016. In connection with promoting those aspects mentioned above, some important problems of agricultural marketing in South Sulawesi were studied as follows:

- a) The physical and technical constraints against the improvement of agricultural marketing
  - i) The agricultural productivity is restricted by physical features such as soil and climate condition, insect and pest. Therefore a volume of farm production and the supply of it to the consuming area is variant among the regions.

The prices of farm products have a wide fluctuation as compared with other type commodities.
  - ii) The main farm products in South Sulawesi Province are commodities for food stuffs, therefore abundant production of these commodities result a fall in prices because consumption in the Province is limited.
  - iii) Almost all farm products in South Sulawesi Province are characterized as perishable commodities, therefore the cost to maintain the quality is added on the marketing system. i.e. packing case, packing work, perishable loss, where the road conditions are not so good.

iv) Agricultural technique is at low the physical feature, therefore the farm products has little good quality as merchandise, i.e. in Kabupa - ten Bhrekang, Tator and Polras there are a lot of those commodities, therefore middleman of the city can buy those with low prices though the traffic cost is high.

6017. b) The socio-economic and farm practical constraints.

v) In South Sulawesi Province almost all farmers are small scale farming, therefore farm products which are traded have to be collected from a lot of farmers. In order to that, each middleman has use many collectors, naturally marketing cost is up by them.

vi) Almost all Desa-s are still in self-sufficient economy, therefore merchandies are surplus of livelihood, and it is very difficult to collect commodities together as marketing unit. Especially, farmer produce many commodities little by little because they make them for self consumption, therefore there are poor marketing system only in Desa-s.

vii) There are scattered distribution of farming in South Sulawesi Province, therefore it is difficult to collect farmers information in which the surplus are much or little.

viii) There is a traditional custom for trading between farmer and middleman in South Sulawesi, therefore farmer cannot get the proper profits, i.e. farmer cannot use the intensive management because almost all farmers are small scale farming and poor. By supplying the new seeds, the input materials and the operation cost such as harvesting, the middleman get the unjustifiable profits more than 50 % against total profit.

ix) There exist many feudal land-ownership custom in South Sulawesi and land rent is payed in kind to landlord by tenants, it is difficult for tenant-farmers voluntarily to select the farm commodities for selling. Besides, farmers can neither make an accumulation for reproduction nor intensive management, because land rent at fee is very high, i.e. 50 % of harvested production.

6018. c) The constraint of communication and transportation between Desa and city.

x) The middleman in the consumption area and marketing system also are small scale and poor. For small marketing system, the facility with stocking and transportation means to be also equiped insufficiently.

xi) Communication net works among Desa-s and cities are poor in South Sulawesi, therefore the Desa-s cannot easily get enough information concerning consumers movement and demand of the cities. The improvement of marketing systems in Desa-s should be emphasized.

xii) Transportation systems are also poor in South Sulawesi. Thus the expenditure of transportation could not be lessen in South Sulawesi.

6.1.6. A summary of comment on marketing and processing by a short-term Expert

6019. A short-term Expert for marketing and Processing, Mr. Nishiyama Iwao has made a series of study on the subject, since 25-th October '77 together with a counterpart Mr. Tadjuddin Dallah at Ujung Pandang and some Kabupaten's emphases have put on transfer of technics, especially how to approach the marketing system development. The findings and reocomendation are as follows :

6020. Marketing systems and prices of agricultural products in Ujung Pandang has been studied. Two Distribution markets, Pasar Terong and Pasar Pabaeng-baeng in Ujung Pandang, even enough they are so called as distribution market, in which the mixed function of distribution and retail are still exist in those market. Consequently, it is not clear that middleman are working as distributors or retail dealers and that prices are for distribution or retail.

6021. The survey has been made on the retail market in Sungguminasa, capital of Kabupaten Gowa. The functions of this market are part of Ujung Pandang, because the distance between two markets is quite near and both are located in the same route of commodity flow. The two cities are already in the same socio-economic conditions.

6022. Ujung Pandang and Sungguminasa are considered to be one area of consumption. This way of thinking will be adaptable for other cities such as Binjai, Pare-Pare, Pinrang, Polpo and Polewali. On this premise, a large distribution market shall be established on the midway of the two cities at the planning stage of future market system.

6023. The pasar Central, Pasar Terong and Pabaeng-baeng in Ujung - Pandang and the pasar Sungguminasa in Gowa are regarded as retail markets in the area.



6024. There are necessities to modernize retailers, helping the establishment of their retailers shop instead of stalls and hut prevailing at present. Thus the retail markets will match with the city conditions and will be able to supply fresh commodities and joyful shopping for citizens who utilized those facilities.

6025. There are many systems which are found in the shipment of agricultural products in the production area, however almost all systems are doing the business not in collectively but between each farmer and middleman separately. Consequently scarce profit are shared for farmers and some-times pre-harvest transactions are seen indicating the poverty of farmers.

6026. The function of BUUD/KUD for purchasing rice by the Government is to be expanded for other commodities. That is to say BUUD/KUD have to work for the collection of commodities and after that price negotiation should be done with middleman by BUUD/KUD.

6027. After accomplishing some expansion of functions in BUUD/KUD, there will be necessity to build up a set of facilities including transit centers, collecting centers and strage facilities. The plan mentioned above has to be decided based on the real conditions of production area.

6028. There will be necessity and availability of a planning on demand and supply after deciding the delivery system in the consumptive area, and the collection and shipment system in the production area. Each consumptive area have decide necessary amounts of demands by commodity by month. At the same time each production areas must make a plan for cultivating and selling which is distinctive of distination by commodity by month. Then the conference will be held among the consumptive areas and production areas to reach conclusion on the demand and supply plan based on the each plan brought by respective area. The production areas have to estimate the amounts of products and shipment and the consumption area must have a justment for the amount and the arrival period by commodity so as to maintain and adequate price. This new work shall be the responsibility for the provincial Government, because it is a policy and implementation for expanded area far beyond the border of Kabupaten Governments.

6029. It is quite important to clarify the future demands and price forecast of estate crops in the international marketing, because the price of many estate crops are influenced by the international prices. In addition, main estate crops such as coconut, coffee, clove and so forth have long useful life and competitive crops. Consequently, prompt dispatch of an additional marketing Expert who has dealt with such aspects mentioned above would be recommended.

6.2. Communication and transportation

6030. The conditions of communication and transportation in South Sulawesi Province were written by the Team of SRDS.

The following items are described in the Report (refer to p.356, Part D, Volume 3, Interin Report of SRDS):

Introduction (Summary & Recommendation)

- 1.1. Road transportation
- 1.2. Sea transportation
- 1.3. Air transportation
- 1.4. Trade and storage

Road Transportation

- 2.1. Road network
- 2.2. Vehicle ownership
- 2.3. Demand for transportation
- 2.4. Cost of new construction, rehabilitation and maintenance of new roads
- 2.5. Major road transportation programs of the past
- 2.6. An inter-regional perspective on road transportation
- 2.7. Major future plans

Sea Transportation

- 3.1. Port location and facilities
- 3.2. Port operations
- 3.3. Major problems and future plans

Air Transportation

- 4.1. Major airports and facilities
- 4.2. Major problems and future plans

Trade and Storage

- 5.1. International trade
- 5.2. Storage

Main point relating to agriculture of the Report is in volume

III.

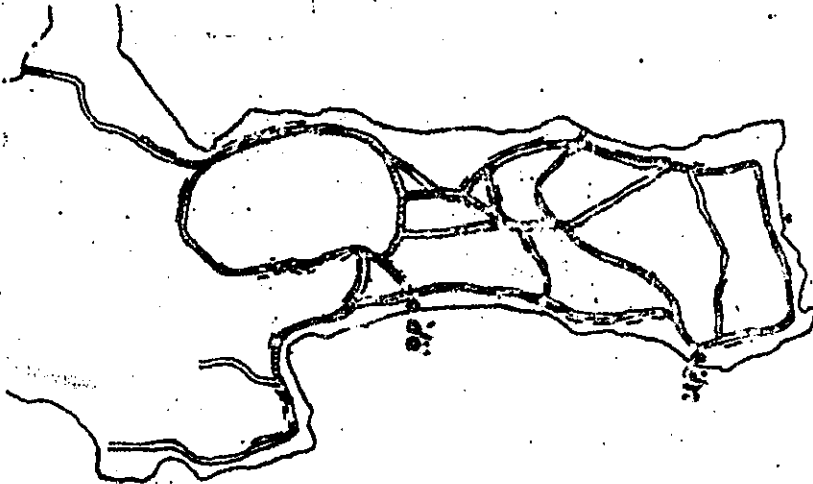
6031. Particularly the following figures 6.7 . - 6.9 . show road condition and traffic state. Some correlation between Palopo in Kabupaten Luwu and Sengkang in Kabupaten Wajo, between Watampone in Kabupaten Bone and Singai and Watansoppeng in Kabupaten Soppeng because there are very bad road condition and poor condition of bridges.

Fig. 6.7. Flow of Goods & Trucks/1974



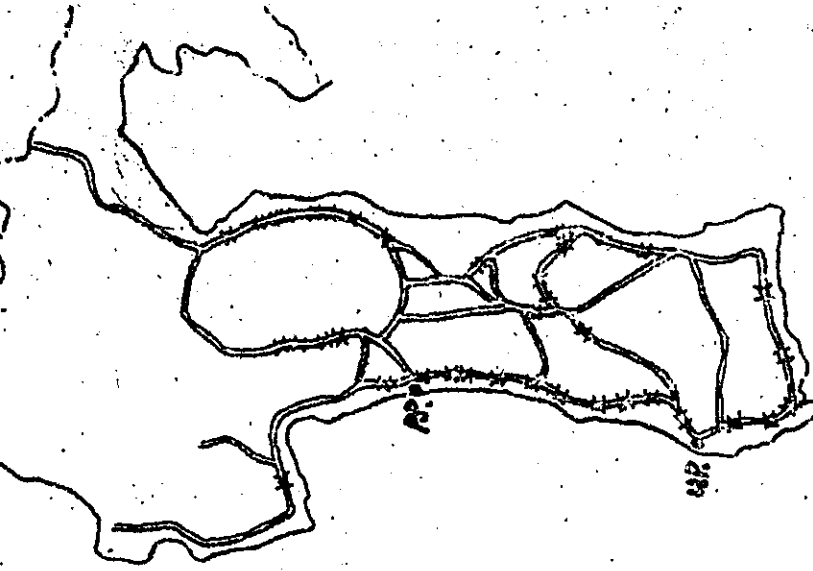
===== much or too much traffic volume  
 ===== very traffic volume  
 ===== a little traffic volume  
 ===== little/very little  
 Source: Dr. Perelomian, Salsol/1974.

Fig. 6.8. Road Condition by Sur-  
face at present/1976



===== good  
 ===== average  
 ===== broken  
 ===== heavily broken  
 Source: DPU, Salsol/1976.

Fig. 6.9. Major Bridges Recon-  
struction programs/  
1976



===== prior construction.  
 ===== Planned.

Source: E2U, Salsol/1976.

7. Administration of agricultural extension service

7001. The agricultural extension as an activity extending agricultural skill and technology is one of the aspect of the agricultural services for development. And the agricultural services include at least the following items:

- a) Agricultural credit service as a capital extending activity,
- b) Agricultural products marketing service as a means for common marketing, and
- c) Agricultural extension service itself as an activity extending skill and technology.

7002. On this occasion the administration and organization of the Agricultural Extension Service will be discussed. To explain about the administration and organization of the Agricultural Extension Service it is advisable to explain the organization of the Ministry of Agriculture.

7003. The organization of the Ministry within the region of the Republic of Indonesia, including the Ministry of Agriculture, has been regulated under a Governmental Decision called the President's Decision No. 44/1974 and No. 45/1974 on fundamentals of the organization of the Ministries and the structure of organization of the Ministries.

7004. The President's Decision has determined that the arrangement of Ministry's organization consists of:

- a) the leader: Minister,
- b) the deputy leader: General Secretary,
- c) the conductor: General Director, and
- d) the supervisor: General Inspector.

7005. Based on this President's Decision, to arrange the structure of organization and the operational principles of the Ministry of Agriculture, the Minister of Agriculture has made a decision called the Decision of Minister of Agriculture No. 190/KPTS/Org/5/1975, which classifies the main duties, function, structure of organization and the operational principles of the organization unit within the scope of the Ministry of Agriculture, both central and regional.

7006. Generally speaking, the organization unit of the Ministry of Agriculture consists of:

- a) the General Secretariate,
- b) the General Inspectorate,
- c) the General Directorate of Food Crops Agriculture,
- d) the General Directorate of Forestry,
- e) the General Directorate of Fishery,
- f) the General Directorate of Husbandry,
- g) the General Directorate of Estates,
- h) the Bureau of Agricultural Investigation and Development,
- i) the Bureau of Agricultural Education, Training and Counselling, and
- j) the Regional Offices in Provinces.

7007. According to what is determined by the President's Decision mentioned above, i.e. the General Secretariate acting as deputy, the General Inspectorate as Supervisor, and the General Directorate as conductor, thus the existence of the Bureau of Agricultural Investigation and Development and the Bureau of Agricultural Education, Training and Counselling constitute supporting units for the development and progress of the conducting unit's endeavors.

7008. It is at the Bureau of Education, Training and Counselling that we hope to find an integrated arrangement of agricultural administration and counselling organization which have the aims of enabling farmers to utilize their ability to improve their welfare as subjects of agricultural development, managing farmers' culture in poly-valenced shape. The organization of the Bureau of Agricultural Education, Training and Counselling consists of:

- a) the Secretariate,
- b) the Agricultural Education and Training Center,
- c) the Personnel Education and Training Center,
- d) the Agricultural Extension Center, and
- e) the Unit of Technical Accomplishment.

7009. The establishment of units of agricultural extension within the Ministry of Agriculture in accomplishing the tasks of the Bureau of Agricultural Education, Training and Counselling, based on the Minister of Agriculture's Decision No. 190/1975 is done by the Agricultural Extension Center.

7010. The organization of the Agricultural Extension Center consists of:

- a) The office of Extension Guidance, which has the task of extending guidance on the matter of counselling (extension), the development of counselling methods, and the preparation and distribution of agricultural informations to the Agricultural Extension Units.
- b) The office of Extension Planning Guidance, which has the task of developing and guiding the arrangement of agricultural extension planning for farmers, which is done by the Agricultural Extension Units.
- c) The office of Extension Administration, which has the task of administering the development and guidance to accomplish the administration of extension, the report on extension and the evaluation on counselling extension for all the Agricultural Extension Units.

7011. The development and guidance of the agricultural extension planning for farmers, which are done by the Agricultural Extension Units, are regulated by the office of Extension Planning and Guidance.

7012. The organization of the office of Extension Planning and Guidance consists of:

- a) the sub-section guidance for adult farmer, which has the task of developing and guiding the programming of adult farmers guidance for the Agricultural Extension Units
- b) the sub-section of guidance for young farmer, which has the task of developing and guiding the formation of farmer youth extension program for Agricultural Extension Units.
- c) the sub-section of guidance for farmer household, having the task to develop and guide the programming of farm household counselling for the Agricultural Extension Units.

With these explanations above we can explain further about the administration and organization of Agricultural Extension viewed from various approaches as follows:

7.1. National, provincial and local governmental services.

7.1.1. National

7013. At national level, there is an Agricultural Extension Center belonging to the Bureau of Agricultural Education, Training and counseling (the Indonesia abbreviation is B.P.L.P.P.) which has the task of building Agricultural Extension Units. The Agricultural Extension Units belong to the Sub-Directorate of Corporational Development under the Directorates of Facility Improvement of the General Directorates of Food Crops Agriculture, Forestry, Husbandry and Estates, and to the Sub-directorate of Fishery Culture Development of the Directorate of Facility Improvement belonging to the General Directorate of Fishery.

7014. Nevertheless, the role of the Agricultural Extension Center as a unit authorized to arrange the establishment of the agricultural extension done by the extension units within national level of the Ministry of Agriculture has not been functioning properly yet.

7015. Hierarchic connection on the regulation of establishment of the agricultural extension, which is temporarily needed within the program of Bimas intensification, has only been seen at the Food Crop Agricultural Extension.

7016. At national level in the General Directorate of Food Crops Agriculture, there is a Project of Food Crops Agricultural Extension directed by the Project Director who is directly subordinate to the General Director of Food Crops Agriculture, having the task, among others, of extending technical guidance to the extension units at provincial level.

7017. The organization of the extension project mentioned above is autonomous and it is not a structural extension device of the General Directorate of Food Crops Agriculture.

7018. Therefore the organizational and functional relations between the extension project mentioned above and the extension unit of the Sub-directorate of Corporational Development within the Directorate of Facility Improvement is not so obvious.

7.1.2. Provincial

7019. At provincial level there is no hierarchy on the regulation and guidance of the administration and organization of agricultural extension as a whole the Bureau of Agricultural extension as a whole the Bureau of Agricultural Education, Training and Counselling.



There is as yet indeed no institution of the BPLPP at provincial level to manage the maintenance and to extend guidance to the extension units of the General Directorate agencies within the Ministry of Agriculture, especially in the attempts of developing methods, the guidance on programming and the guidance on the accomplishment of the counselling activity. Whereas the activity ought to be handled by an institution of the Agricultural Extension Center of the BPLPP at provincial level so that the approach to agricultural extension problems in the regions can be done consistently, the same way as the Central Education and Training for personnels which has its activity at provincial level in the form of Personnel Education and Training.

7020. Thus up to this time the activities of constructing and developing agricultural extension services at provincial level, both in the planning and the implementation are still entirely handled by the extension unit of the General Directorate with the methods and techniques according to each their sections.

7021. It is even apparent that in some extension units within agricultural agencies in South Sulawesi Province, they have lost their structural shape, so that the administration and organization of the extension service towards the Kabupaten's, Kecamatan's and Desa's levels are vague and even disconnected.

We take for example:

7022. a) the extension units belonging to the Fishery Service supported by Agricultural Extension Specialists (PAS) in the fields of:

- i) fish capture,
- ii) culture,
- iii) processing techniques and
- iv) cooperative agencies,

are found to do more routine activities than counselling activities, due to indefinite financial support as well as indefinite direction.

7023. b) At the Husbandry Service, the extension unit is situated at the Bureau of Production, with its administrative and organizational hierarchy which are not clear down to the Kabupaten's level of extension unit.

7024. c) At the Forestry Service, there is relatively no special extension unit, the only existing one being the Educational Section which has the job to select among the personnel who are to be trained at the Forestry Education and Training Center in Ujung Pandang or Bogor.

7025. Thus the integrated program of approach towards the solution of problems especially faced by farmers in their poly-valenced culture has not been concreted yet.

7026. Whereas the endeavor to solve problems within the agricultural development cannot stand apart from the integrated approach of problems. And the important matter is the exact choice and determination of the strategic main problem, since the exactness in determining the strategic problems is already a step onward, both in accelerating solution of the problem alone to achieve optimal results, and in economizing costs.

7027. It means that efficiency and effectivity can be improved for the utilization of nature potential resources in developing the agricultural sector. Exclusively for the Estates Service, they are waiting for the authorization from the South Sulawesi Governor for an extension unit as a structural organ within the organization of the South Sulawesi Estate Service which is directly subordinated to the chief of service at provincial level.

7028. Since the South Sulawesi Estates Service has only an agency at residential level and there is no agency of it at Kabupaten's level, the extension service to the estate farmers is given by the extension unit which exists at the Regional agency. At the Provincial Food Crop Agricultural Service, the extension unit is directly subordinated to the chief of Provincial Level Service as a Bureau in Organizational Structure of Service.

7029. The chief of this extension unit educated five PPS-es who have each their speciality in the respective fields of:

- a) agronomy,
- b) agro-economics,
- c) soil and irrigation, and
- d) extension methods and techniques.

7030. The task of the Head of Extension Unit in the education of those specialists is to coordinate their work plan and activities relating to administrative matters, operational facilities, coordination with other heads of Bureaus in Service Organizations, Investigation Institute Universities etc. for the smooth run of the PPS' job.

7031. At the regional level extension unit, four PPS-es work in their respective speciality:

- a) agronomy,
- b) agro-economics,

- c) soil and irrigation, and
- d) plant protection.

7032. The PPS' job at the provincial level extension unit is aimed at the tackling and developing of regional matters, e.g.:

- a) informing Institutes of Investigation and Universities to receive, process and continue the new findings, or extend problems to be investigated further,
- b) giving informations to the residential and kabupaten level PPS-es about the new technological development, both concerning government programs and for the solut of farming problems in the field,
- c) conducting surveys and making evaluations on the result of agricultural extension activities, and
- d) processing and analyzing survey findings and field experiments to be used as basis for the development of agricultural extension programs.

7033. While the PPS' job at the regional/residential level extension unit is stressed on the solution of field problems faced by the Field Agricultural Extension Workers (PPL).

#### 7.1.3. Kabupaten and Kecamatan (Districts)

7034. Not all agencies of the General Directorate within the Ministry of Agriculture in South Sulawesi Province have an extension unit at Kabupaten's level, let alone at kecamatan's level. That is why not all activities in Developing the agricultural sector, especially those in connection with the utilization of nature potential resources, without damaging their prosperity, have been accomplished by means of guided and organized extension service.

7035. Out of so many activities in the development of the agricultural sector, which are striving to enable farmers in utilizing their potentials to improve their welfare, only the Food Crop Agricultural Service has been conducting the administrative arrangement of the agricultural extension service down to the desa unit regions within the range of the BIMAS program.

7036 At the kabupaten level Food Crop Agricultural Service there is an extension unit where a new PPS is working, who handles more about general gardening. A PPS' main job at kabupaten's level extension unit is stressed on the guiding of Senior Field Agriculture Extension Workers (PPL-s) at kabupaten's level and at the Rural Extension Centre in accomplishing the extension activity.

7037. The number of PPL-S at kabupaten's level in Rural Extension Center (R.E.C.) is two persons. Each R.E.C. is directed by a PPL-S and it covers ten to fifteen Rural Unit Regions (Wilud). While the criteria of Wilud formation is based on the following items:

- a) the range of service including an acreage of 600 to 1,000 ha of paddy fields,
- b) the farthest distance from the farmer to the center of the Wilud is 8 hours vice-versa, and
- c) there must be four forms of service facilities:
  - i) a Rural Unit Bank (of the B.R.I) which functions in extending credits,
  - ii) a Rural Extension Service with at least one PPL,
  - iii) a Village Unit Store/Kios to serve as supplier of production devices: fertilizers, pesticides, seeds and farming equipments.
  - iv) BUUD/KUD (Village Units of Cooperative and Cooperative of Village Units) which function in the marketing and processing of products and the economic activities of the farmers.

7038. The agricultural extension service is conducted service. A PPL has five fundamental tasks, i.e.:

- a) to distribute useful agricultural informations,
- b) to teach better agricultural skill,
- c) to suggest more profitable farming industry,
- d) to make efforts to get the devices, facilities and agricultural informations required, and
- e) to develop self-ability and self-support in farmers to achieve a more prosperous living.

7039. By applying a new extension method called the Training-and-Visiting system (which is abbreviated LAKU from the Indonesian term Latih-an-dan-Kunjungan) it is expected that one PPL will train 16 Key farmers/Kontak Tani (from 16 different farmers group), and one Key farmer will train 20 progressive farmers (as his group number), while one progressive farmer will train about 5 ordinary farmer.

Thus one PPL is expected to do his job within an area included in one Wilud which is about 600 to 1,000 ha. in acreage and which has about 1,500 farmers in it.

## 7.2. Agricultural Institution

7040. It turns out that there is no steady planning on the development of an agricultural extension which includes food crop agriculture, fishery, husbandry and estate, adapting the potentials which can be developed within the development of the agricultural sector in each kabupaten.

7041. The agricultural institution as the Agricultural Extension Center activities which exist at present is still at its preparatory stage in South Sulawesi Province and it consists of Rural Extension Center, Agricultural Extension Service and Agricultural Information Center.

### 7.2.1. Rural Extension Center/R.E.C.

7042. A pilot activity for this purpose is being started by the BPLPP by means of the USAID. Four Rural Extension Centers have been built in the kabupaten Luwu in the scope of the Luwu Project for the development of the agricultural sector through the transmigration program in the regions. Those four REC-s will include 4 fields according to agricultural potentials which need to be developed at the location of its existence, such as the following:

- a) REC on food crop agriculture at Kecamatan Bone-Bone,
- b) REC on fishery at Kecamatan Walenrang,
- c) REC on husbandry at Kecamatan Mangkutana, and
- d) REC on estates at Kecamatan Baje.

7043. Such REC-s seem more useful and therefore they need to be developed in other Kabupaten-s according to the agricultural potential which needs to be developed. Those four RECs in the kabupaten Luwu constitute facilities to support a consistent approach towards the solution of problems concerning the development of agricultural sector in the region. Therefore there has to be a coordination of the guidance in program formation synchronizing activities which have to be developed through RECs at provincial level.

### 7.2.2. Agricultural Extension Service

7044. As a basis of extension activities of the Food Crops Agriculture Extension Project and it constitutes an institution within the rice BIMAS program to conduct the following activities:

- a) formulating an extension program for farmers,
- b) spreading informations on agriculture which is useful for farmers by means of films, slides, demonstrations etc,

- c) suggesting more provitable farming industries by means of trials, demonstration plots and so on,
- d) helping to find devices needed by farmers, e.g. Seeds of high variety, pest-proof high varieties etc.,
- e) teaching the knowledge of agricultural skill through farming courses, demonstration plots/demonstration farms, contests, trainings etc., and
- f) developing farmers' self-supporting and self-laboring abilities to improve their welfare by means of meetings with farmers groups, discussion etc.

7045. An Agricultural Extension Service directed by a PPL-S or a Middle Agricultural Extension Worker/PPM will functionally serve ten Wiluds handled by 10 PPL-S to train 15,000 farmers according to the extension method of the IAKU system.

7046. This extension method applying the IAKU system for South Sulawesi Province is only at the preparatory stage, where the agricultural extension institutions referred to above is also only at its preparatory stage of the aid of World Bank through the Agricultural Extension Project at the General Directorate of Food Crops Agriculture in Jakarta, which is planned to be 46 in number. The personnel directly involved in the implementation of this new method of extension is composed of the following:

- a) Middle Agricultural Extension Worker/PPM  
or senior PPL 138 persons,
- b) Field Agricultural Extension Worker/PPL 620 persons,  
and
- c) Agricultural Extension Specialists/PPs 52 persons.  
(see table 7.1.).

7.2.3. Agricultural Information Center

7047. This agency appears to be an activity unit of the Agricultural Extension (HPLPP) at provincial level, which is at its planning stage only.

Table 7.1. List of Agricultural Extension Service distribution plan  
PPS, PPM and PPL in the development of Rural Regions in  
South Sulawesi Province

Province/Regions/Kabupaten-s	Wiluds	BPP	FPS	PPM	PPL
A. Province	-	-	5	-	-
B. <u>Representatives</u>					
1. Region I Palopo	-	-	4	-	-
2. " II Bone	-	-	4	-	-
3. " III Bantaeng	-	-	4	-	-
4. " IV Ujung Pandang	-	-	4	-	-
5. " V Pare-Pare	-	-	4	-	-
6. " VI Polewali	-	-	4	-	-
Total	-	-	24	-	-
C. <u>KABUPATEN</u>					
1. Luwu	60	4 *)	1	2	60
2. Tana Toraja	30	3	1	8	30
3. Pare-Pare municipal	2	1	1	4	2
4. Pinrang	63	4	1	10	63
5. Sidrap	62	3	1	8	62
6. Barru	14	2	1	6	14
7. Enrekang	13	1	1	4	13
8. Polmas	20	3	3	8	20
9. Bone	59	4	1	10	59
10. Soppeng	30	3	1	8	30
11. Wajo	58	4	1	10	58
12. Pangkep	30	2	1	6	30
13. Maros	26	2	1	6	26
14. Ujung Pandang	4	1	1	4	4
15. Gowa	41	4	1	10	41
16. Takalar	18	1	1	4	18
17. Jeneponto	17	1	1	4	17
18. Bantaeng	12	1	1	4	12
19. Bulukumba	31	2	1	6	31
20. Sinjai	15	1	1	4	15
21. Majene	5	1	1	4	5
22. Selayar	5	1	1	4	5
23. Mamuju	5	1	1	4	5
Total	620	46	23	138	620
Grand Total	620	46	52	138	620

7.3. Other services for farmers

7048. In addition to the agricultural extension mentioned above, we will present in headlines the bureau of agricultural credit service and the service for common marketing of agricultural products.

7049. Although an activity already exists which serves credits and common marketing, and which has already extended services to industries of fishery, husbandry and estates, it is only an insignificant activity, so that its approach is restricted to the service of credit and the service of the common marketing within the scope of the BIMAS only. Those two kinds of service are included within the functions of the four devices of the Wilud-s where the village unit bank (B.R.I.) has its job in credit service (the channelling and return of credits), and afterwards through the KUD functionally serves the farmers in getting the necessary production devices (seeds, fertilizers, pesticides and equipments for pesticides).

7050 Especially for the service of common marketing of rice, it is executed by means of the BUUD/KUD. Based on the decision of the Governor of South Sulawesi No. 487a/VII/1977, the 23 kabupaten-s and Kotamadya, 156 Kecamatan-s and 956 Desa-s in South Sulawesi Province excluding the Kecamatan-s and Desa-s within Kotamadya are classified into 620 Wilud-s with their already-existing four facilities:

a) PPL-s	358 persons,
b) Rural Unit Bank (the B.R.I.)	199 units,
c) BUUD/KUD (including that for fishermen, Spta Marga villages and copra)	345 units, and
d) Kios	508 units.

7051. Up to the end of December 1977 these four facilities have increased as follows:

a) PPL-s	593 persons, and
b) B.R.I.	210 units.

7052. Thus the remaining lack of the four facilities is as follows:

a) PPL-s	24 persons,
b) B.R.I.	100 units.
c) BUUD/KUD	301 units, and
d) Kios	1,938 units.

(see table 7.2.).



Table 7.2. Distribution of WILUD and their facilities in South Sulawesi Province (1977.7.1.)

No.	Kabupaten/ Kotamadya	Kecamatan	Number of WILUD	Village 1)	Existing Four facilities			
					PPL	BRI	KUJD/ KUD 2)	Stores
1.	Luwu	14	50	143	29	18	24	35
2.	Tator	9	31	65	20	10	14	52
3.	K.M. Pare-Pare	3	2	12	2	2	1	4
4.	Pinrang	7	61	37	40	20	28	41
5.	Sidrap	7	52	30	40	22	24	24
6.	Barru	5	13	24	9	9	11	11
7.	Enrekang	5	14	28	8	4	5	14
8.	Polmas	8	36	83	18	7	16	26
9.	Bone	21	50	205	32	12	27	46
10.	Soppeng	5	50	46	20	12	13	33
11.	Wajo	10	58	51	16	10	24	2
12.	Pangkep	6	30	33	16	10	6	34
13.	Maros	4	26	41	20	7	17	43
14.	K.M. U.Pandang	3	6	13	4	4	5	1
15.	Gowa	8	41	47	32	17	31	40
16.	Takalar	6	18	35	8	6	26	34
17.	Jeneponto	5	21	28	12	5	14	14
18.	Bantaeng	3	12	15	9	3	8	6
19.	Bulukumba	7	31	33	19	7	21	25
20.	Sinjai	5	17	38	10	5	12	20
21.	Majene	4	9	20	2	4	11	3
22.	Selayar	5	5	20	-	2	4	4
23.	Mamuju	6	7	27	-	2	4	-
<b>Total</b>		156	620	956	358	199	345	508

SK. Governor's decision no. 487 a/VII/1977, July 6, 1977.

Note : 1) excluding the Kecamatan and Desas within Kabupaten of  
municipal cities.

2) including the BUUD / KUD of fishermen, Septa marga  
villages and Copra.

(Continue)

Table 7.2. Distribution of WILUD and their facilities in  
South Sulawesi Province  
(Continued)

No.	Kabupaten/ Kotamadya	Required Four facilities			
		PPL	BRI	BUUD/KUD	Stores
1.	Luwu	50	25	50	175
2.	Ta tor	31	15	31	152
3.	K.M. Pare-2	2	2	2	10
4.	Pinrang	61	30	61	250
5.	Sidrap	52	26	52	250
6.	Barru	13	9	13	112
7.	Enrekang	14	7	14	36
8.	Polmas	36	18	36	100
9.	Bone	50	25	50	212
10.	Soppeng	30	15	30	105
11.	Wajo	58	29	58	152
12.	Pangkep	30	15	30	150
13.	Maros	26	13	26	150
14.	K.M. U.Pandang	6	4	6	5
15.	Gowa	41	20	41	250
16.	Takalar	18	9	18	67
17.	Jeneponto	21	10	21	62
18.	Bantaeng	12	6	12	22
19.	Bulukumba	31	15	31	52
20.	Sinjai	17	8	17	22
21.	Majene	9	4	9	7
22.	Selayar	5	2	5	7
23.	Maruju	7	3	7	10
Total		620	310	646	2,438

Table 7.3. Condition of development of WILUD until October 1977 in South Sulawesi Province

No.	Kabupaten/Kodaya	Number of WILUD	P.P.J.				Facilities of WILUD			KIOS SAPRODI	
			Old	Added	Total	Old	Agged	Total			
<b>I. Daerah Kelompok A.</b>											
1.	Pinnrang	61	40	20	60	19	1	20	28	41	
2.	Sidrap	52	37	23	60	19	4	23	24	24	
3.	Soocong	30	22	8	30	9	4	13	13	33	
4.	Gowa	41	32	8	40	15	2	17	31	40	
5.	Majene	27	22	8	30	7	-	7	17	43	
6.	Pangkep	30	15	15	30	10	-	10	6	34	
7.	Polmas	36	18	12	30	5	4	9	16	26	
8.	Luwu	50	30	15	45	15	4	19	24	35	
<b>II. Daerah Kelompok B.</b>											
9.	Tator	31	20	12	32	9	2	11	14	52	
10.	Bone	50	32	13	45	11	2	13	27	43	
11.	Wajo	58	16	24	40	9	1	10	24	2	
12.	Baru	13	8	7	15	9	-	9	11	11	
13.	Bulukumba	31	19	14	33	7	1	8	21	25	
<b>III. Daerah Kelompok C.</b>											
14.	Barekang	14	8	7	15	3	2	5	5	14	
15.	K.M. Pare-2	2	2	2	4	1	1	2	1	4	
16.	K.M.U. Pandang	6	4	2	6	3	1	4	5	1	
17.	Takalar	18	9	9	18	6	-	6	16	34	
18.	Jenepono	20	12	8	20	5	-	5	14	14	
19.	Bantaeng	12	9	6	15	2	2	4	8	6	
20.	Sinjai	17	10	7	17	4	2	6	12	20	
21.	Majene	9	2	2	4	2	2	4	11	3	
22.	Selayar	5	-	2	2	2	-	2	13	-	
23.	Mamuju	7	-	4	4	2	1	3	4	-	
<b>Total</b>			620	367	226	596	174	36	210	345	508

Source : Dinas Pertanian Rakyat, Sul - Sel.

7.4. Agricultural Education and Training

7053. Basically there are two categories of targets to be achieved by the agricultural education and training activities, especially those which will be executed by the BPUP, i.e.:

- a) prospective middle level technicians, and
- b) personnel within the range of the Ministry of Agriculture. Whereas the targets to be achieved by the agricultural extension activity itself will be the farmer and his household.

7.4.1. The agricultural education

7054. The aims of the agricultural education is to produce middle level technicians who are able to promote the productivity and profitability where ever he works, for whoever he works and in whatever field he works.

7055. Such as agricultural education in South Sulawesi Province has a secondary level agricultural school which consists of the following:

- a) 1 public secondary agricultural school in Ujung Pandang,
- b) 5 public and private secondary agricultural school in the regions respectively in Ujung Pandang, Palopo, Makale, Polmas and Bone, and additionally, 1 private secondary school for husbandry in Ujung Pandang and 1 secondary husbandry course in Ujung Pandang. Those who are accepted as pupils in these schools are male and female Junior High School graduates majoring in mathematics who have passed their entrance test. These schools will produce PPL-s. The management of these schools is regulated by the EPLPP in Jakarta.

7.4.2. Personnel training

7056. The agency conducting this kind of training at provincial level is the Agricultural Training Center/PPL. The objectives of this training are:

- a) to increase the knowledge and skill of agricultural extension workers who are educated maximally under the new project agricultural school which has a poly-valenced feature, and
- b) to improve the knowledge and skill of PPL-s.

7057. The term of this training for agricultural extension workers is 6 months, which is divided into 3 stages, each of 2 months' term. The agricultural extension worker referred to here is the Chief of Extension Service at Kecamatan's level and the Chief of Seeds Center,

Seed farms, and other agricultural objects of the same level, who is not more than 49 years old.

7058. The training for PPL-s in 2 months' term, and this term is divided into 2 stages of one month each.

The people joining this training are the PPL-s graduated from the Secondary Agricultural School who are not poly-valent in quality yet. The management of this training is regulated by the BPLPP in Jakarta.

#### 7.4.3. The Agricultural Counselling

7059. This is accomplished by the PPL-s or PPM-s within the range of the BIMAS intensification of counselling by the LAKU system, the farmer is classified into groups referred to as:

- a) the adult groups,
- b) the woman groups, and
- c) the young farmer groups.

Up to 1976 the following number of groups are present condition in South Sulawesi Province:

- a) 2,191 adult groups,
- b) 133 woman groups, and
- c) 144 young farmers groups.

7060. The counselling program according to the LAKU system which is executed by the PPL is regulated as follows:

- a) PPL makes visits to the farmers in the fixed groups at a certain place, twice a month,
- b) the number of farmer groups visited at the first and second visiting stages is 16 groups with the following schedule of visits:
  - i) first week on Monday, Tuesday, Wednesday and Thursday, 8 groups are visited, 4 groups in the morning and 4 groups in the afternoon,
  - ii) Fridays are used by the PPL to make his report, and Saturdays for meetings in the desa or kecamatan,
  - iii) second week on similar days as in first week, another 8 groups are visited in the mornings and in the afternoons,
  - iv) third week, repeat visiting the groups visited in first week on same days, and
  - v) fourth week, repeat visiting the groups visited in second week, on same days.
- c) The material for each visit is adjusted to the farmers' needs for the next two weeks.

7061. Thus each PPL is obliged to have the capability to perform training to 16 Key farmers and each Key farmer must in turn be able to train 20 progressive farmers, while each progressive farmer has to train 5 ordinary farmers.

7062. Agricultural extension given through the Agricultural Extension Service may be of the following features, according to the program:

- a) agricultural information by means of films, slides and demonstrations,
- b) teaching on farming industry by means of trials and demonstration plot plots,
- c) teaching skill by means of Farmers' Courses, demonstration plots and farms contests and training, and
- d) developing self-reliance and self-supporting ability by means of meetings and discussions.

7.5. Conclusion

7063. 1) Based on the approach that:

a) about 75 % of the productive labor force in South Sulawesi Province are not present not graduated from Elementary School at adolescent to old ages,

b) about 75 % of the regional income of South Sulawesi at present (1976) originated from the agricultural sector,

c) farmers and farming activities are relatively located in Desa-s,

d) the majority of farmers' industry in the form of household types are still subsistent in property and combined with polyvalent activities, and

e) the development of the agricultural sector in the whole development program is inseparable from the utilization of natural resources by taking care of the maintenance of their well being,

it is obvious that here lies the urgency for the prompt completion and adjustment of the regulation and implementation of organizations and administrations for the management of service institutions, from the national level down to the village level, which move in the following fields:

a) agricultural counselling, extending technology and skill,

b) credits as an activity which extends capital, and

c) activities for the common marketing of agricultural products.

7064. 2) Agricultural Extension Units at national level at the General Directorates under the Ministry of Agriculture are still essential to be structurally present according to their respective fields, while the extension units at the EPLPP constitute the coordinator to build and maintain the approach to problems integrately and towards the solutions included in the development of the agricultural sector.

7065. At provincial level, all agencies of the General Directorate under the Ministry of Agriculture have to possess Extension Units structurally besides the Extension units from the EPLPP for provincial level, which guide the composing of extension programs linked with the attempts to solve problems as a whole within the polyvalent farmers' industry.

7066. At Kabupaten's level there has to be an extension unit which receives and passes on and feeds back informations from and to the extension units at provincial level.

7067. 3) To know how far the function of the service goes in the field of agricultural extension, and what the farmers think about the service to enable them to utilize the potentials and improve their welfare, a more detailed survey is still needed exclusively.

8. Present Situation of Agricultural Development by Bloc

8.1. Main characteristics of each Bloc

8001. The Provincial Government divides the South Sulawesi Province into five (5) Blocs as developmental sub-regions, respectively:

Bloc I: The South Development Bloc (or Ujung Pandang Bloc),

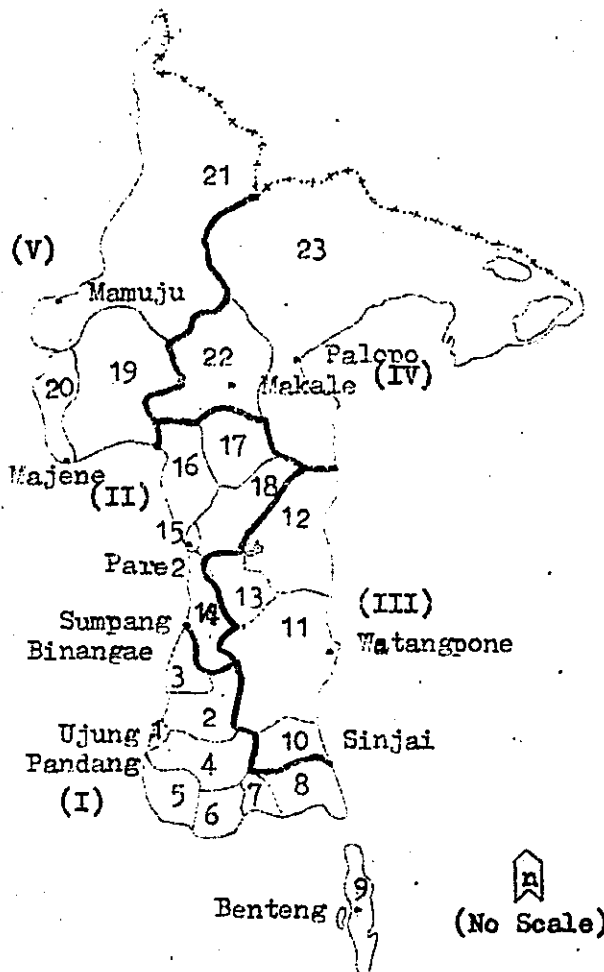
Bloc II: The West Development Bloc (or Pare-pare Bloc),

Bloc III: The East Development Bloc (or Watampone Bloc),

Bloc IV: The North Development Bloc (or Palopo Bloc), and

Bloc V: The Mandar Development Bloc (or Polewali Bloc).

Fig. 8.1. Five Development Blocs of South Sulawesi





8002. The main characteristics of each Bloc are as shown on Table 8.1. Particularly, the population density in Bloc IV and V is only 33 and 32 persons per km<sup>2</sup>, while there is a large potential area for transmigration, which will be developed in accordance with the advance of transportation system.

8003. Farmland per household in the Province is larger than the national average; particularly that in Bloc II is the largest in the province, because of the small rate of increase in the number of farm households. This Bloc, along with Bloc III, have paddy field ratio of over 50%, and have been supplying rice to other provinces (Refer to Table 8.2).

#### 8.2 Present situation of food stuff production

8004. The rate of increase in the gross value of food crop production has big fluctuations in Bloc III alone, and yet a high rate of increase in the gross value of food crops in each Bloc has been kept, such as shown in Fig. 8.2., because rice price has increased. On the other hand, Fig. 8.3 shows an interesting fluctuation by Bloc; harvested area of rendengan paddy in Bloc III fluctuates greatly, just as is shown in the curve of Bloc III in Fig. 8.2

8005. In bloc II its harvested area declined from that in 1970, but gadu paddy has been increased, in accordance with the advance of the saddang irrigation project.

8006. The effect/result is shown in Fig. 8.4, i.e. the drastic increase of gross value per farmer based on the increased gadu paddy production in the irrigated area and the upheaval of rice price. However, in Bloc III, where most paddy fields are merely rainfed, and where it is impossible to shift from rendengan paddy to gadu, farmers' economy is made unstable.

8007. Fig. 8.4. shows that the gross value per farmer in Bloc I is lower than the average of the province. The reason is that the paddy field ratio is low, and there is little cash crop farming.

Table 8.1. Main characteristics of each Bloc

	I	II	III	IV	V	Total
Population (1000 persons)	2,187	808	1,391	737	531	5,654
(100%)	( 38.7)	(14.3)	(24.6)	(13.0)	(9.4)	(100)
Farm household (1000 households)	218	109	203	113	79	722
(100%)	( 30.2)	(15.1)	(28.1)	(15.7)	(10.9)	(100)
Total land (1000 ha.)	854	691	817	2,335	1,596	6,293
(100%)	( 13.5)	(11.0)	(13.0)	(37.1)	(25.4)	(100)
Population density (man/km <sup>2</sup> )	256	117	170	32	33	90
Farm land (1000 ha.)	347	214	343	196	100	1,200*
Farm land ratio (%)	0.41	0.31	0.42	0.08	0.06	0.19
Farm land per household (ha.)	1.59	1.96	1.69	1.73	1.27	1.66
Paddy fields (1000 ha.)	135	113	175	63	23	509
Paddy field ratio : farmland (%)	0.39	0.53	0.51	0.32	0.23	0.42

Remark: \*) Excluding waste land and shifting cultivation land.

Source: Estimation by the Team.

Table 8.2. Estimation of farm households by Bloc in South Sulawesi

Unit : 000 household

No.	Year	Bloc I	Bloc II	Bloc III	Bloc IV	Bloc V	Total of province
1.	1970	198.3	102.2	180.9	97.1	63.5	642.2
2.	1971	201.9	107.2	195.5	101.5	74.1	680.4
3.	1972	206.7	109.4	196.4	106.2	75.0	693.9
4.	1973	207.9	109.8	195.4	105.8	74.7	693.8
5.	1974	210.4	106.1	196.7	109.6	76.6	699.7
6.	1975	214.6	108.3	200.7	111.8	78.1	710.9
7.	1976	218.3	109.0	204.1	114.0	79.4	722.2

8.3. Priority of regional agricultural development

8008 According to Fig. 8.5, the balance of food supply and demand by Bloc, excluding Bloc III, has a slight fluctuation. There seems to be a big correlation in the fluctuation between Bloc III and the entire province (Refer to Fig. 8.6)

8009. It may be said that the big fluctuation in Bloc III is the main reason for the total fluctuation of products in the province. If the production of food crops in 1972 and 1974 were not decreased, the surplus shown in Fig. 8.6 would be stabilized.

8010. The gross income by food crop production has the same tendency in Bloc III. Consequently the farmers' economy has not developed as compared with the other Blocs. (Refer to Fig. 8.2).

8011. The reason why Bloc III has been a very unstable harvest area is mainly the fact that paddy is merely rainfed in its cultivation. (Refer to Fig. 8.3).

8012. On the other hand, Bloc II which comprises the kabupaten-s of Sidrap, Pinrang and Naros as stable areas is provided with water from the Saddang Irrigation Project. Moreover, the areas have a comparatively well-developed farmers' organization.

8013. Food crop production of the province in the past was unstable by year. This tendency prevented the development of transportation and marketing of staple food stuff.

8014. As a conclusion, the instability of paddy production and agricultural transportation in Bloc III is the bottleneck of the development of the entire province. Consequently the priority for development should be put on Bloc III and the development of this area would be available by the water resource development project of the Tempe Lake.

Table 8.3. Land productivity and food production per capita by Bloc

Bloc	Productivity (kg/ha)			Per capita (kg/capita)		
	1974	1975	1976	1974	1975	1976
I	1,580	1,700	1,680	260	274	267
II	1,230	1,760	2,610	348	488	716
III	1,000	1,790	1,390	257	458	350
IV	760	930	1,180	216	260	325
V	930	1,170	940	195	240	190
Average	1,160	1,560	1,620	261	345	351

Table 8.4. Production volume of food stuff by Bloc

Bloc	P r o d u c t i o n   v o l u m e						F a r m   L a n d	
	1974		1975		1976		000 ha	%
	000 ton	%	000 ton	%	000 ton	%		
I	547.0	39.2	588.3	31.3	582.9	30.0	347	29
II	263.6	18.9	377.4	20.1	557.5	28.7	214	18
III	342.3	24.6	612.9	32.7	477.0	24.5	343	29
IV	148.0	10.6	181.4	9.7	231.6	11.9	196	16
V	93.4	6.7	116.9	6.2	94.4	4.9	100	8
Total	1,394.3	100.0	1,876.9	100.0	1,943.4	100.0	1,200	100

Table 8.5. Production volume of rice and secondary crops by Bloc

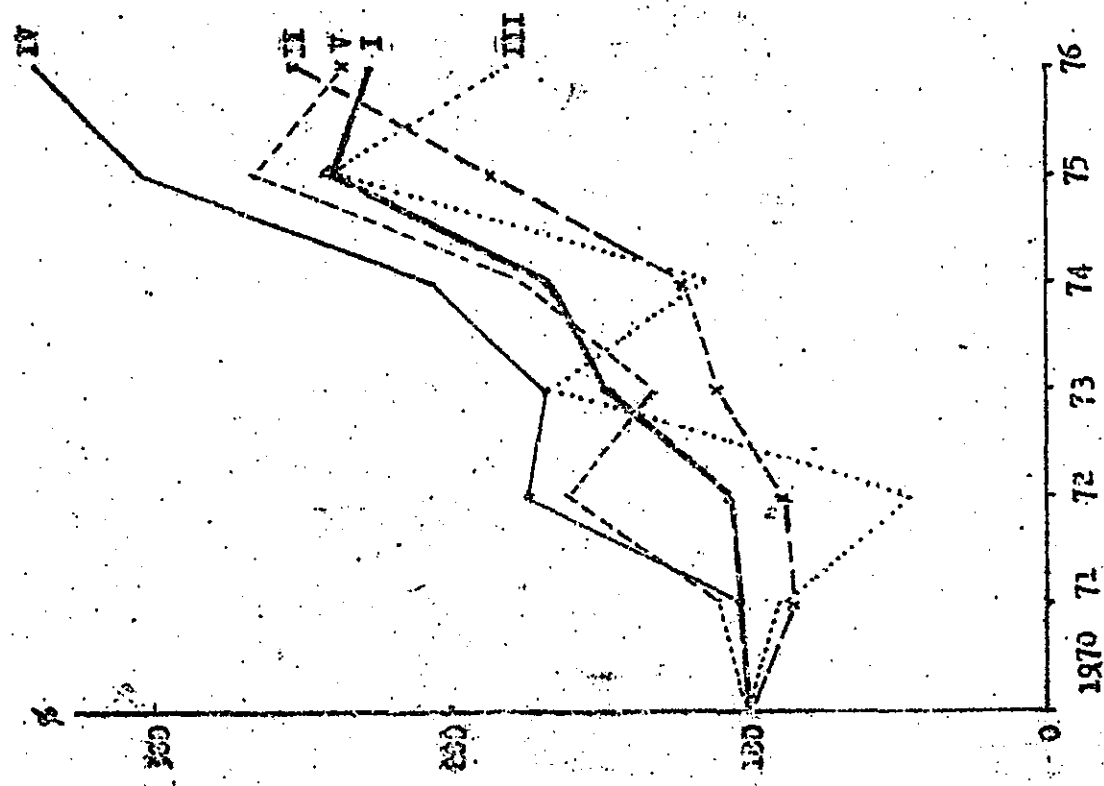
Bloc	1974		1975		1976	
	Rice	Sec.crops	Rice	Sec.crops	rice	Sec.crops
I	469.4	50.6	529.4	58.9	525.0	57.9
II	259.6	4.0	373.2	4.2	552.6	4.9
III	313.6	28.7	576.9	36.0	440.9	36.1
IV	144.1	3.9	178.4	3.0	229.2	2.4
V	86.4	7.0	112.1	4.8	89.8	4.6
	1,273.1	94.2	1,770.0	106.9	1,836.9	105.9

Table 8.6. Development of the gross value of food production by Bloc

Unit : million Rp

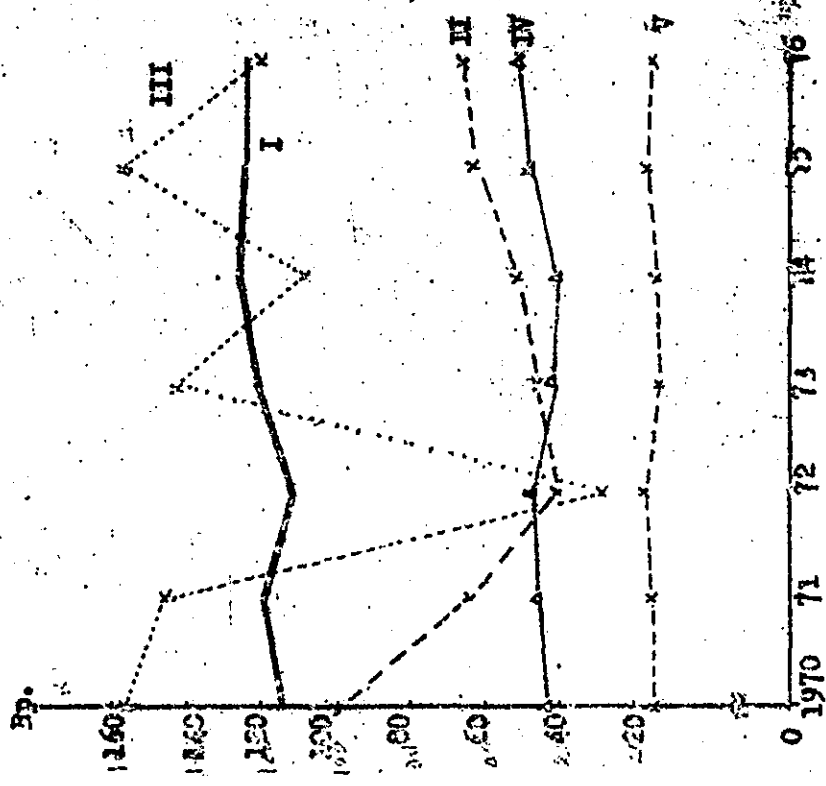
Year	Bloc I	Bloc II	Bloc III	Bloc IV	Bloc V	Total	Index
1970	17,637	13,074	17,020	4,508	3,500	55,742	1.00
1971	18,148	11,116	15,039	4,568	3,807	52,680	0.95
1972	18,690	11,498	7,632	7,714	5,568	51,183	0.92
1973	25,914	14,556	27,756	7,508	4,593	80,329	1.44
1974	29,139	15,824	19,272	9,198	6,124	79,559	1.43
1975	41,919	24,092	40,592	13,562	9,207	129,365	2.32
1976	39,697	32,659	30,541	15,231	8,231	126,361	2.27

Fig. 8.2. Increase Rate of Gross Value of Food Crops' Production



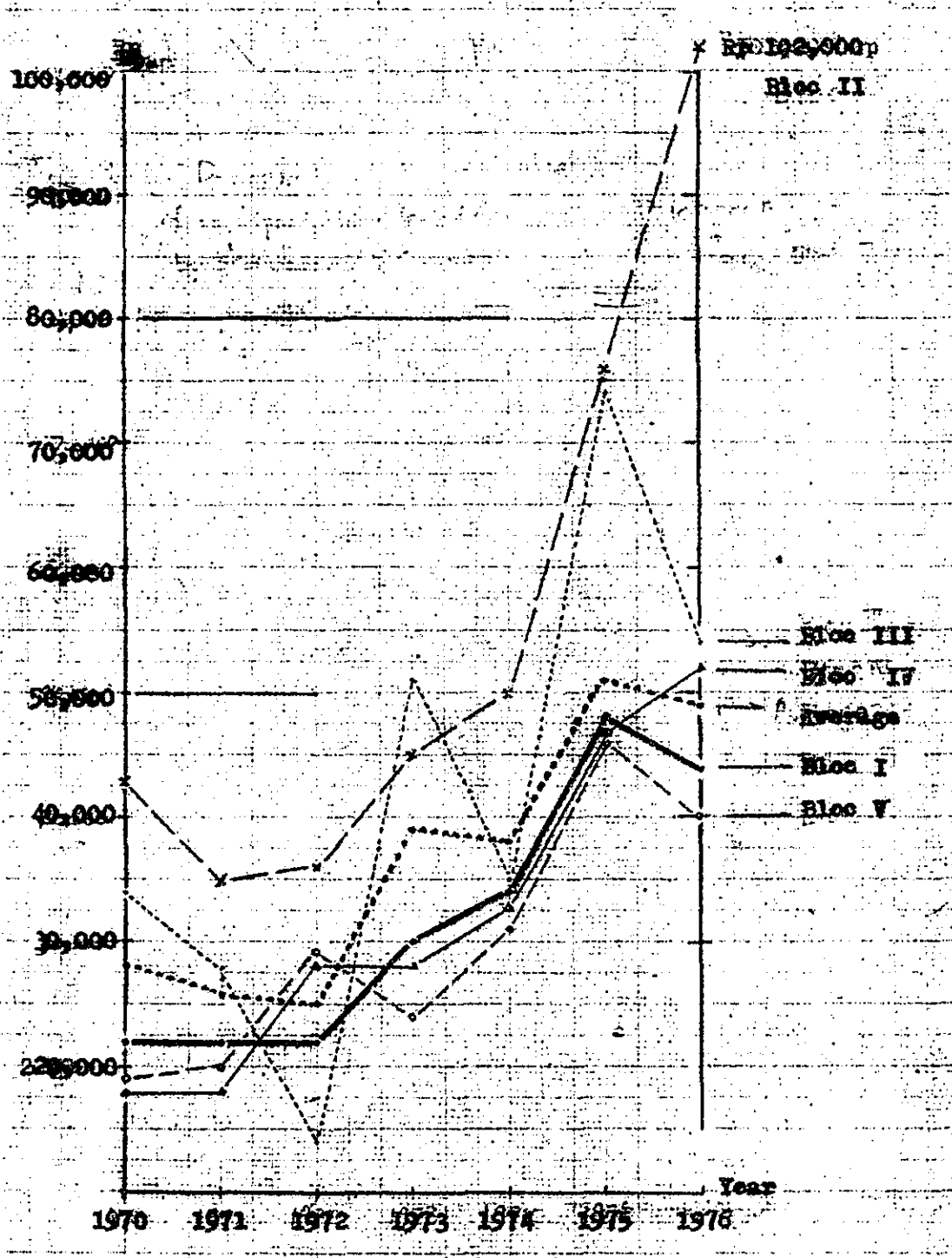
Source: LAFFEDA of South Sulawesi.

Fig. 8.3. Fluctuation of Harvested Area of Rubber, etc.



Source: Laporan Dinas Pertanian Rakyat of South Sulawesi.

**Fig. 8.4. Development of food production's gross value per farmer in South Sulawesi by Bloc**



Source: Estimation by the Team.

Fig. 8.5. Balance of Food Supply & Demand By Bloc

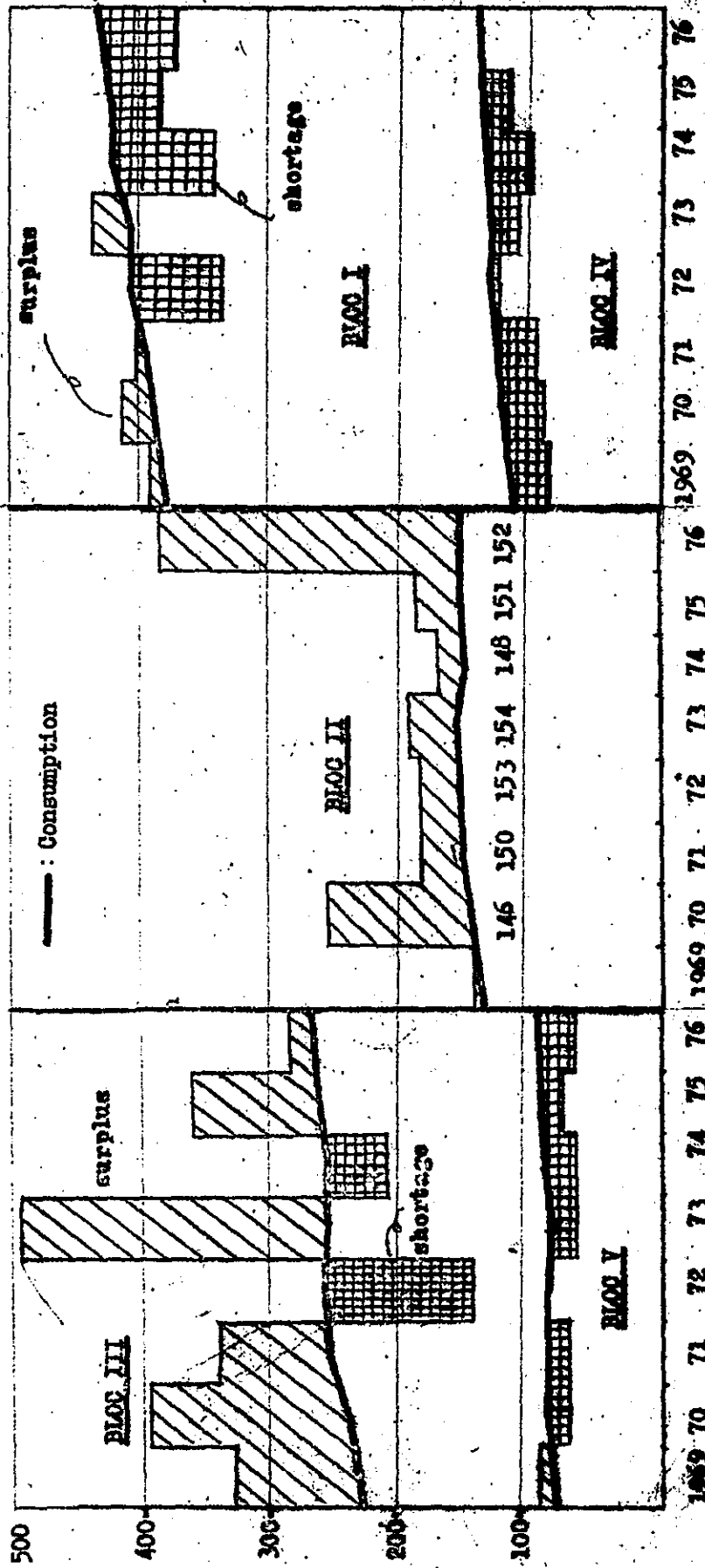
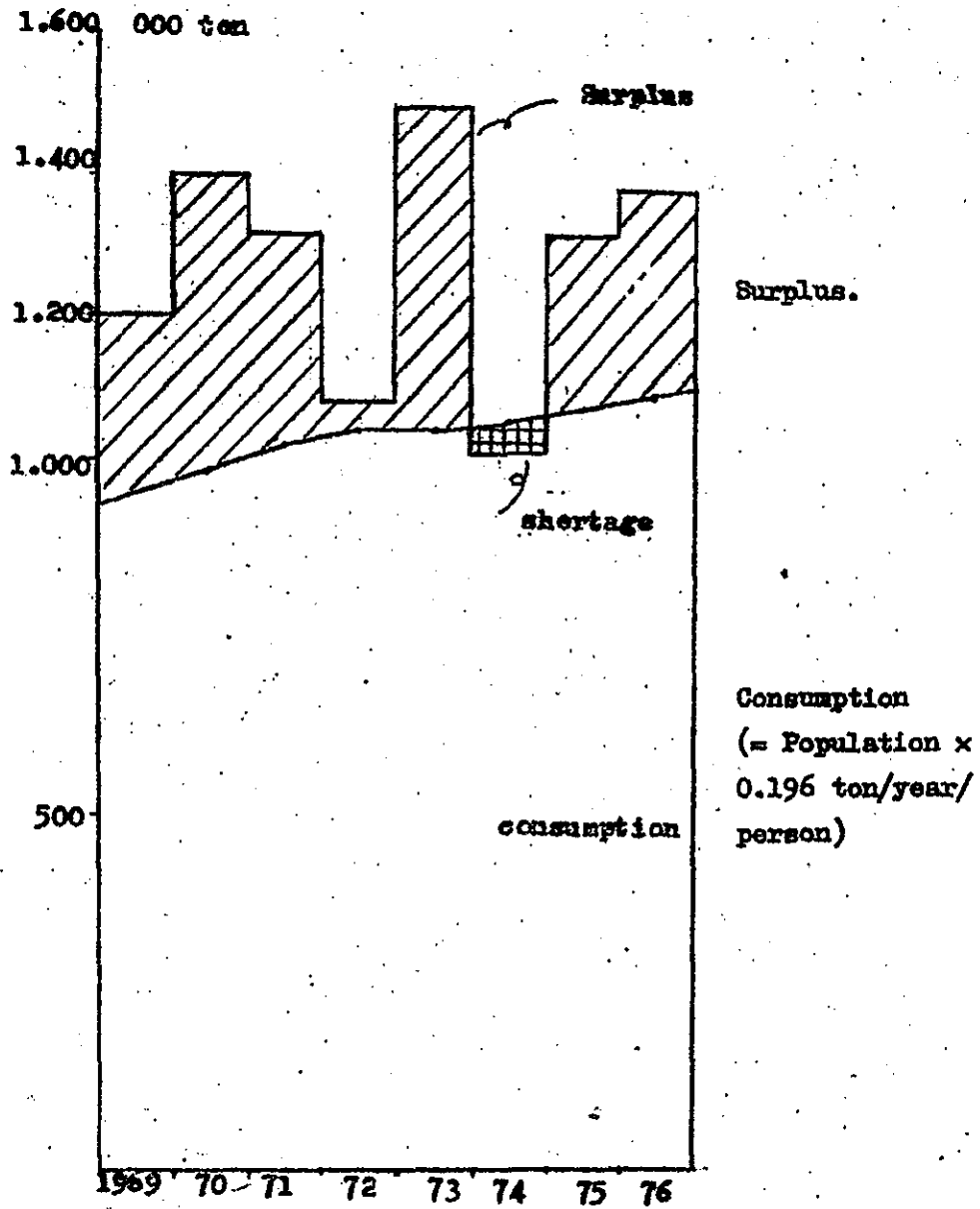




Fig. 8.6. Balance of Total Demand & Supply of Food  
in South Sulawesi



Source: Laporan Dinas Pertanian & Dinas Kesehatan,  
South Sulawesi Propinsi.

8.4. Outline of Bloc I : the South Development Bloc

1) Agriculture . . . . .

i) Food crops

8015. The food crop products in this Bloc comprise rice, corn, beans, cassava, sweet potato, vegetables and fruit. These commodities are produced by every area in this Bloc but each area has its important commodities. The important areas of the following food crops are respectively:

- Rice/paddy : Gowa, Bulukumba, Pangkep and Maros.
- C o r n : Bulukumba, Jeneponto and Bantaeng.
- B e a n s : Pangkep, Gowa and Jeneponto.
- Cassava : Gowa, Bulukumba, Jeneponto and Ujung Pandang.
- Vegetables : Jeneponto and Gowa; and
- F r u i t : Jeneponto and Bulukumba.

(Refer to volume III).

ii) Estate crops

8016. The estate crop products in this Bloc are coconut, candlenut, nutmeg, coffee, clove, capok, sesame, tobacco, Gnetum gnemon, Canarium commune, pepper, sugar cane, cotton and rubber. But the outstanding and significant products are coconut, candlenut, coffee, capok, sesame, cotton and tobacco; clove is only found in two Kabupaten-s, i.e. Gowa and Bulukumba.

The producing areas of estate crops are as follows:

- Coconut : Selayar, Pangkep and Bulukumba.
- Candlenut : Gowa, Bantaeng and Bulukumba.
- C o f f e e : Bulukumba and Bantaeng.
- C a p o k : Bulukumba, Bantaeng and Jeneponto.
- S e s a m e : G o w a
- Tobacco : Gowa and Maros.
- Sugar-cane : Jeneponto and Takalar; and
- C o t t o n : Jeneponto.

(Refer to volume III).

iii) Fishery

8017. The fishery products in this Bloc are: marine fish, river fish, brackish water fish, and fish cultivated in marshes and paddy fields. The most outstanding production is from the sea, brackish water fish ponds and marshes.

8018. The biggest production belongs to the following fishery areas (Refer to volume III).

Marine fish : Takalar, Bulukumba and Ujung Pandang.  
Brackish water fish : Pangkep, Takalar and Bulukumba, and  
Marsh water fish : Gowa, Bulukumba and Takalar.

iv) Animal husbandry

8019. The potential livestock population in this Bloc consists of buffaloes, cattle, horses, goats/sheep, pigs and fowls. These animals are distributed throughout the bloc excluding Ujung Pandang, where only two kinds of them are present, i.e. buffaloes and pigs. Further it is also seen that pigs are only found in three areas: Ujung Pandang, Gowa and Bantaeng. The areas with the largest number of livestock of each kind are respectively:

Buffaloes : Gowa, Maros and Takalar;  
Cattle : Bulukumba, Maros and Pangkep;  
Horses : Bulukumba, Bantaeng and Jenepono;  
Goats/sheep : Jenepono, Bulukumba, Selayar, Bantaeng and Gowa;  
P i g s : Ujung Pandang, and  
F o w l s : Gowa, Bulukumba and Maros.

v) F o r e s t r y

8020. The products of forestry in this Bloc, according to the data obtained in 1974, are respectively as follows: peeled candlenut wood (of the poor quality only), mixed wood, fire wood, rattan, palm fiber, bamboo and palm sugar (brown sugar). Other products originated from main forests, and these are fire wood, rattan, timber and "bayam" wood. The products, both of the cultivated and of the main forests, can be specified according to the biggest producing areas as follows: the biggest producing area of cultivated products is kabupaten Maros, while that of main forest products is kabupaten Takalar, and the biggest cultivated products are wood and bamboo, while those of main forests are also wood; Thus the entire wood production in this Bloc in 1974 amounted to 3,702,747 m<sup>3</sup>, consisting of 3,670,200 m<sup>3</sup> products of cultivated forests and 32,547 m<sup>3</sup> those of main forests (Refer to volume III).

2) M i n i n g

8021. This Bloc has quite a big potentiality in minerals, and they

are mostly uncultivated and only to the extent of surveys. The areas possessing minerals according to the surveys undertaken are: Kabupaten Maros - nickel ores, copper ores, coal, petroleum, gypsum, marble, cobalt, aluminum and lead. Kabupaten Pangkep - coal and earth oils; and Kabupaten Gowa - sand and limestone.

### 3) I n d u s t r y

8022. The number of undertakings of various industries in this Bloc in 1974 is as follows:

Ujung Pandang	1,347
Kabupaten Maros	103
Kabupaten Pangkep	131
Kabupaten Gowa	362
Kabupaten Takalar	40
Kabupaten Jeneponto	45
Kabupaten Bantaeng	20
Kabupaten Bulukumba	50
Kabupaten Selayar	12

8023. The biggest productive kinds of industries are: industries of food and beverages, ready-to-wear clothes, wood and rattan furniture, construction materials and earthenware, printing and publication, and handicrafts and ornaments.

8.5. Outline of Bloc II : The West Development Bloc.

1) Agriculture

i) Food crops

8024. Food crop production in this Bloc consists of rice, corn, peanut, soy bean, green peas and cassava. All these commodities are produced in each of the areas within this Bloc. The outstanding and most productive ones are paddy (rice), corn and cassava. The biggest rice producer is Kabupaten Pinrang and Sidrap. Their average rice production amounts to 341,950 tons each year, while corn and cassava are respectively 14,875 tons and 26,765 tons each year. This indicates that the main products of this area is rice (refer to volume III).

ii) Estate crops

8025. The estate crop products in this Bloc are coconut, coffee and candlenut. The biggest producing area of these commodities is respectively: kabupaten Pinrang for coconut, Brekang for coffee and candlenut.

iii) Fishery

8026. The outstanding fishery products in this bloc are marine fish, brackish water fish and lake fish. There are also fish from the marshes, the paddy fields and the rivers but they are insignificant in number.

The fishery production of the Bloc in 1974 were:

Marine fish	: 18,730.2 tons
Brackish water fish	: 6,874.2 tons
Lake fish	: 876.2 tons.

The biggest producing areas of each kind of fish are: kabupaten Sidrap : lake fish; Kabupaten Pinrang: marine fish; kabupaten Barru and Pare-Pare : brackish water fish.

iv) Animal husbandry

8027. The livestock population which is quite potential in this Bloc consists of cattle, buffaloes, horses, goats, pigs and fowls. The population undergoing a fast growth in the period of 1971-1974 are respectively buffaloes, cattle and goats. The areas having the largest population of livestock are: Kabupaten Sidrap: buffaloes, Kabupaten Barru: Cattle and goats, and kabupaten Pinrang: fowls (refer to volume III).

v) F O R E S T R Y

8028. The forestry products in this Bloc are wood, rattan, natural silk, brown sugar and resin.

According to the data from 1971 to 1974, the products which were quite potential were wood, rattan and candlenut; natural silk, brown sugar and resin are not significant yet but they have quite a promising future. The biggest producing area of each of these forest products are respectively: Kabupaten Barru - wood; Kabupaten Sarekang and Barru - candlenut; Kabupaten Sidrap and Sarekang; rattan; and Kabupaten Sarekang; natural silk (Refer to volume III).

8.6. Outline of Bloc III: The East Development Bloc

1) A g r i c u l t u r e

i) Food crops

8029. The commodities quite potential in this Bloc are rice, corn, peanut, soy bean, green peas, cassava, sweet potato and a kind of long beans. Rice, corn and cassava are the main products in this Bloc. A decrease is seen in the amounts of production of rice and corn, while an increase is seen in the production of cassava in this Bloc. (Refer to volume III).

ii) estate crops

8030. The estate crops within this Bloc occupy an area of about 34,628.52 ha., and their products are coffee, tobacco, capok, candlenut and coconut. The biggest producing areas of each of these commodities are successively: Kabupaten Sinjai - coffee, Kabupaten Wajo - Coconut, Kabupaten Soppen, - tobacco, and Kabupaten Bone - capok (Refer to volume III).

iii) F i s h e r y

8031 This bloc has quite a big potential in fishery, especially in fish production. A very sharp increase is seen in the growth of production from 1971 to 1974, namely, the rate was 12,802.20 tons in 1971 and it became 30,279.07 tons in 1974. These products are obtained from the sea, lakes, rivers and fish ponds, marshes and paddy fields. The biggest

fish producing areas are respectively: Kabupaten Bone and Sinjai for marine fish, Majo for lake fish and Bone for brackish water fish. No data is obtained on other fishery products (Refer to volume III).

iv) Animal husbandry.

8032. This Bloc has quite a big husbandry potential, and there is also a large number of livestock population in the various kinds of husbandry. The potential livestock population consists of buffaloes, cattle, horses, goats and fowls. All kinds of these livestock have had an increase during the period of 1971-1974 except for buffaloes and chicken which had a decrease, i.e. buffaloes from 106,824 heads in 1971 to 97,693 heads in 1974 and chickens from 3,933,759 heads in 1971 to 1,188,169 heads in 1974. The population of livestock which has an outstanding increase is cattle, with an increase from 101,026 head in 1971 to 190,493 heads in 1974 (Refer to volume III).

v) F. o. r. e. s. t. r. y.

8033. The potential forestry products in this Bloc are: wood, rattan and candlenut. The outstanding producing areas are Kabupaten Bone and Sinjai for wood, Majo for rattan and Bone for candlenut. The forest production in 1974 were 427,121,348 m<sup>3</sup> of wood, 54.3 tons of rattan and 9.5 tons of candlenut.

2) M. i. n. i. n. g.

8034. No activity is apparent in this Bloc, as mining is still in the stage of surveys. Survey findings show the presence of copper ores in Kabupaten Bone.

3) I. n. d. u. s. t. r. y.

8035. The industry in this Bloc consists of industries of food and beverages, tobacco, textile and ready-to-wear clothes, wood, rattan and furniture, printing and publishing, non-metal manufacturing industries, metalwork industries, processing industries, and handicrafts. The greatest ones among these are tobacco and handicraft industries.

8.7. Outline of Bloc IV : The North Development Bloc.

1) Agriculture

i) Food crops

8036. Food crop products in this bloc are rice, corn, peanut, soy bean, green peas, cassava, sweet potato, vegetables and fruit. The most outstanding and quite important ones are rice, corn, cassava, sweet potato, vegetables and fruit. The biggest producing areas are Kabupaten Luwu for rice, vegetables and fruit, and Kabupaten Tana Toraja for cassava and sweet potato. The production of each commodity shows a desirable increase from 1971 to 1974.

ii) estate crops

8037. Estate crop products in this Bloc are coffee, tobacco, candlenut, clove and pepper. The productive and quite significant commodities are coconut, coffee, capok, clove and pepper, while kabupaten Tana Toraja produced coffee. A decrease in production occurred for coffee and pepper, but other commodities increased.

iii) Fishery

8038. Fishery in this Bloc includes marine fishery and inland fishery. Marine fishery is only found in Kabupaten Luwu. The greatest fishery products are those of marine fishery; so Luwu has the greatest products. The smallest amount of fishery products occurs in river fishery. In 1974 a decrease was seen in the production of marine fishery as compared with that in 1971. The same decrease was seen in the production of pond fishery.

For other fisheries an increase is still to be seen.

iv) animal husbandry

8039. The most important products of animal husbandry in this Bloc are buffaloes, cattle, horses, goats, pigs and fowls. The kinds having big potentiality are buffaloes, cattle and pigs. Kabupaten Tana Toraja is the biggest producer of buffaloes, pigs and horses, while Luwu produces the other kinds of livestock. The largest number of livestock population occurs in Kabupaten Luwu, and yet in 1974 a decrease was apparent compared with 1971. This was due to a decrease in the number of pigs occurring each year since



v) F o r e s t r y

8040. The main products of forestry in this Bloc are wood, rattan and resin. As for the manufactured products, there are two kinds, i.e. craftsmanship and export manufactured. About 80,657 m<sup>3</sup> has been manufactured for export in 1971 and about 130,840 m<sup>3</sup> in 1974. This shows quite a big increase, whereas the craftsmanship products were 60,900 m<sup>3</sup> in 1971 and 138,467 m<sup>3</sup> in 1974. Export woods and resin are only produced in Kabupaten Luwu. Other products, i.e. those of craftsmanship, are mostly found in kabupaten Tana Toraja. Rattan products are found in Kabupaten Luwu.

2) M i n i n g

8041. This bloc is quite potential in minerals; some of them have been exploited or surveyed and some have not. The kinds of minerals found in this Bloc, especially in kabupaten Luwu, are nickel, copper, kerosene, gold, iron, coal and gypsum. Besides nickel, which has been processed, other mines have been surveyed by the Bandung Technical Institute and the PERTAMINA.

Gold, copper and sulphur mines are found in Kabupaten Tana Toraja.

3) I n d u s t r y

8042. The industry which is quite potential in this bloc comprises industries of food and beverages, wood and rattan furniture, earthen construction materials, gold and silver jewelry, wood handicrafts, wood sawyers, china and earthen potteries, weavery, and others (for instance bamboo and mat plaitings).

8.8. Outline of Bloc V : The Mandar Development Bloc

1) A g r i c u l t u r e

i) F o o d c r o p s

8043. Food crop products in this Bloc are rice, corn, peanut, soy bean, green peas, cassava, sweet potato, vegetables and fruit. Among those mentioned above, the outstanding ones are rice, corn, cassava, vegetables and fruit.

The greatest producing areas for each kind of those crops are respectively:

Kabupaten Polmas for rice and cassava, Kabupaten Majene for fruit and vegetables, and kabupaten Mamuju for corn.

ii) Estate crops

8044. The products of estate crops in this Bloc are coconut/copra, coffee, kapok, candlenut, nutmeg, pepper and cacao. The largest production among those is the coconut, and this commodity is also the largest one in all the blocs, occupying an area extending 24,429 ha. Coconut constitutes a very important estate crop in this Bloc. The amount of coconut production in this Bloc in 1971 was 23,431.2 tons and in 1974 it was 24,182.1 tons.

The biggest coconut supplying area is kabupaten Mamuju, and next come Majene and Polmas.

iii) Fishery

8045. Just the way it is with the other Blocs, this Bloc has quite a great potentiality in fishery, both inland and marine. Most of the fishery products originated in the sea, where the average annual rate of production from 1971 to 1974 was about 9,800 tons, while that of inland fishery was 1,500 tons. The biggest amount of inland fishery products is that of fish ponds and paddy fields. The greatest marine fish producing area is kabupaten Polmas, and this area is also the greatest producer of inland fishery.

iv) Animal husbandry

8046. The potential livestock population in this Bloc consists of buffaloes, cattle, horses, goats, pigs, and fowls (chicken and duck), but the most outstanding ones are cattle, buffaloes, goats and pigs. The biggest livestock producer is kabupaten Polmas, and it is estimated that 75% of the livestock population of this Bloc occupy this Kabupaten.

v) Forestry

8047. The forestry products in this Bloc comprise those of cultivated forests: black wood, fire wood, rattan, copal and cinnamon wood, and products of main forests/reserved forests i.e. resin and brown sugar. The biggest producing area of forestry products in this Bloc is kabupaten Mamuju, followed successively by Polmas and Majene, while the biggest forestry products are rattan and black wood.

2) Mining

8048. According to information obtained, which Bloc has quite a big potential in mining, and several kinds of minerals are found, respectively:

Gold, copper, steel, mica, kerosene and coal in Mamuju; and in Polmas: gold, copper iron, mica and zinc. No information is obtained concerning kabupaten Majene. Exclusively in kabupaten Mamuju, three kinds of minerals are most outstanding, i.e. gold, copper and kerosene, which have been surveyed by P.T. ISSA and the PERTAMINA in 1975.

3) I n d u s t r y

8049. The same way as in the other Blocs, there is a big potentiality of industry within this bloc. The most outstanding industries are those of textile, tobacco, manufactures, wood, rattan and bamboo furniture, metalworks, handicrafts, and non-metalworks.

Agricultural condition of South Sulawesi

9. Production structures of the agricultural sector.

9.1. Food crops

9.1.1. Paddy/rice

1) The condition of the paddy cultivation.

9001. The average of the total acreage of paddy cultivation during the Polita (1969-1976) is 564,000 ha., consisting of :

- a) Rendengan (the wet season's paddy) : 428,000 ha.
- b) Gadu (dry season's paddy) : 100,000 ha. and
- c) G o g o (upland/dry field paddy) : 36,000 ha.

Compared to the total acreage of paddy cultivation in 1969, the average of the total acreage of paddy cultivation during the Pelita has increased only by 1%, i.e. from 556,000 ha to 564,000 ha. The developments of the total acreage of paddy cultivation is unsteady, and fluctuation due to a decrease of the total acreage by 21% in 1972, to 445,000 ha.

9002. The decrease of the acreage by 21% in 1972 was due to the shortness of the wet season's period and the lack of rainfall, both in the west coastal and in the east coastal areas of South Sulawesi Province. Whereas the decrease of acreage of paddy cultivation by 2% in 1974 was due to lack of rainfall and the spread of the pest "tungoro". This fact affected the decrease in 1972, both concerning the rendengan and the gadu, which were respectively 19% and 37%.

9003. The acreage of the rendengan decreased by 3%, i.e. from 439,000 ha. to 428,000 ha., while that of gadu increased by 63% namely from 61,000 ha. to 100,000 ha. Quite the contrary occurred to the gogo as the acreage decreased continuously year by year, i.e. from 56,000 ha. to 36,000 ha. or a decrease of 35%. This decrease in the acreage of the gogo is consistent to the Polita II of the South Sulawesi BAPPEDA which demands a decrease in the acreage of the gogo in accordance with the salvation program of catchment areas.

9004. The distribution of the acreage of paddy cultivation in South Sulawesi Province is two-sided with two different planting seasons due to the specific geographical state. The different planting seasons are indicated by different periods as follows :

a) The period October to March is the wet seasonal planting period for the west coastal area of South Sulawesi Province, while for the east coastal area, this is the same period of the dry seasonal planting period.

b) The period April to September is the wet seasonal planting period for the east coastal area while for the west coastal area, this is the same period constitutes the dry seasonal planting period.

9005. The area undergoing the wet season during the period October to March are 14 Kabupaten-s and Kotamadya-s, i.e. U.Pandang, Maros, Pangkep, Mamuju, Majene, Selayar, Erekang, Tator, Gowa, Takalar, Barru, Pare-Pare, Jeneponto, and part of Luwu. At the same time, nine other Kabupaten-s are undergoing the dry seasonal planting period, the nine Kabupaten-s are; Bantaeng, Bulukumba, Sinjai, Bone, Wajo, Soppeng, Pinrang and part of Luwu. The same case occurs with the opposite season, April to September, when the nine Kabupaten-s mentioned above undergo the wet seasonal planting period while the 14 others undergo the dry seasonal planting period.

9006. Thus there is a continuous planting season throughout year in whole South Sulawesi Province, and thereby on December 31 each year there is a carry-over of paddy cultivation for the following year. The trouble in this case is that the statistical data from the Agricultural Extension Service does not include the amount of carry-over as the remains of paddy cultivation, so that it is difficult to calculate.

9007. The following developments of the acreage of paddy planted areas by BIMAS/INMAS and non-intensification way, based on the condition mentioned above, are carrying out as two planting seasons, from April to September and from Oktober to March (see table 9.1). The total acreage of paddy planted areas by BIMAS during the period April-September has decreased by an average of 17%, while that of by the non-intensification has decreased by an average of 1.1% during the three years 1974-1976. During the period October to March, the total acreage by BIMAS has increased by an average of 5.4%, while that of by the non-intensification has decreased by an average of 0.8%, during the three years 1974-1976.

9008. The average acreage of planted area of the Rendengan during the three years 1974-1976, is 85% of the whole paddy fields area 509,000 ha., or an acreage of 431,897 ha. And the average acreage of planted area of the Gadu in 1975-1976 is 29% or an acreage of 147,873 ha.

Table 9.1. The acreage of paddy planted areas by period and season in South Sulawesi Province (1974-1976).-

Period April - September.

				Unit: ha.
Y e a r	Program	Wet season	Dry season	T o t a l
1974	BIMAS	32,364	5,111	37,475
	INMAS	5,384	244	5,628
	NON-Int.	189,461	85,064	274,525
1975	BIMAS	32,599	5,528	38,127
	INMAS	8,963	1,529	10,492
	NON-Int.	201,665	83,042	284,707
1976	BIMAS	44,743	5,960	50,703
	INMAS	26,088	4,607	30,695
	NON-Int.	182,385	85,654	268,039

Period October - March

				Unit: ha.
Y e a r	Program	Wet season	Dry season	T o t a l
1974	BIMAS	40,991	16,617	57,608
	INMAS	4,914	7,128	12,042
	NON-Int.	142,385	20,111	162,396
1975	BIMAS	34,520	21,967	56,487
	INMAS	13,953	6,086	20,039
	NON-Int.	140,317	25,801	166,018
1976	BIMAS	37,615	26,106	63,721
	INMAS	20,952	14,491	35,443
	NON-Int.	136,494	28,575	165,069

Note: 1) NON-Int. - non-intensificatiob.

Table 9.2. Acreage of farm lands in South Sulawesi Province (1975)

No.	KABU- PATEN	P a d d y f i e l d s				
		(1)	(2)	(3)	(4)	(5)
1.	Luw.	1,304.50	965	32,506.75	10,541.75	45,318
2.	Tat.	-	600	5,275	11,926	17,801
3.	Sop.	2,000.00	3,755.05	9,441.69	6,496.12	21,692.86
4.	Bon.	4,880.00	1,500	7,550	60,236	74,166
5.	Waj.	-	450	2,078	65,760	68,288
6.	Sin.*	-	800	1,255	8,453	10,508
7.	Bul.*	-	2,780	18,105.28	1,485.48	22,370.76
8.	Sel.	-	-	-	799	799
9.	Ban.	-	580	3,751	684	5,015
10.	Jen.	-	3,060.09	4,714.49	5,968.06	13,742.64
11.	Tak.*	3,450.00	2,310	1,475	8,888.35	16,123.35
12.	Gow.*	9,337.51	-	6,235	14,650.09	30,222.60
13.	UP.*	-	-	250	3,706.38	3,956.38
14.	Mar.	2,014.16	399.06	2,947.44	16,338.48	21,699.14
15.	Pan.	1,500.00	600	1,505	17,268	20,873
16.	Bar.	1,850.00	500	2,315	5,817.38	11,482.38
17.	P.P.*	-	-	300	578.69	878.69
18.	Sid.	17,851.46	9,448.84	5,505.94	12,319.27	45,125.51
19.	Ehr.	-	-	3,268	5,732	9,000
20.	Pin.	29,300.89	2,381	3,221.58	12,011.29	46,914.67
21.	Pol.	5,700.00	2,377	2,821	9,327	20,225
22.	Maj.	-	-	355	780	1,135
23.	Mam.	-	-	1,065	416	1,481
Total:		79,188.52	32,506.94	115,941.17	281,182.25	508,818.88

Notes : \* ) Source : B.P. Bimas (temporary numbers) (Continue)  
 \* ) No detailed information  
 1) Paddy fields by technical irrigation  
 2) Paddy fields by semi-technical irrigation  
 3) Paddy fields by Desa irrigation  
 4) Rainfall.  
 5) Total of paddy fields.

Table 9.2. Acreage of farm lands in South Sulawesi Province (1975)  
(continued)

Kab K.M.	Up-land / dry land				Unit : ha.
	Dry lands (6)	dry field (7)	home yard (8)	Total (9)	Total (5+9)
01	15,452.50	17,605	8,837.01	41,894.51	87,212.51
02	89,639.00	9,934	1,790	101,363	119,164
03	33,670.51	-	1,345.19	35,015.70	56,708.56
04	25,808.00	36,286	20,277	82,371	156,537
05	38,746.00	3,682	9,402	51,830	120,118
06	9,122.60	20,938	2,095	32,155	42,663
07	44,155.88	43,573.56	1,975.40	89,804.84	112,075.60
08	957.00	19,084	189	20,230	21,029
09	17,097.00	-	453	18,050	23,065
10	25,800.87	425	726.57	26,952.44	40,695.08
11	5,372.61	1,863.85	3,835.39	11,071.85	27,195.20
12	37,965.00	14,437.67	8,599.54	61,992.21	91,224.81
13	---)	---)	---)	5,629.77	9,586.15
14	8,103.86	8,513	8,066.12	24,682.98	46,382.12
15	13,940.00	3,652	651	18,243	39,116
16	5,426.84	6,560.90	2,041.12	14,028.86	25,511,24
17	1,393.65	-	133	1,526.65	2,405.34
18	6,709.75	13,469.29	5,818.21	25,997.35	71,122.86
19	9,513.00	13,994	1,359	24,866	33,866
20	27,909.34	5,694	11,662.31	55,265.65	102,180.32
21	17,799.00	29,605	19,760	67,164	87,389
22	12,494.00	2,636	160	15,290	16,425
23	9,148.00	5,814	3,178	18,140	19,621
Total	466,723.81	257,767.27	112,353.96	836,845.04	1,345,663.92



Table : 9.3 Acreage of the planted areas with paddy Gogo by  
Kabupaten and year in South Sulawesi Province  
(1969 - 1976)

	1969	1970	1971	1972	1973	1974	1975	1976
01. Luwu	8,547	7,722	6,180	4,733	3,335	4,272	4,793	4,986
02. Tator	12	4	4	-	2	2	-	13
03. Soppeng	2,026	1,666	1,333	1,232	1,355	983	764	579
04. Wajo	4,331	4,012	5,684	3,932	2,005	1,341	946	1,715
05. Bone	14,960	11,267	9,711	6,758	8,290	5,558	4,901	4,568
06. Sinjai	15	620	600	350	362	20	45	-
07. Bulukambe	45	50	196	110	30	18	-	-
08. Selayar	2,366	2,351	2,148	1,398	816	566	582	590
09. Bantaeng	631	805	314	275	78	-	-	-
10. Jenejonto	-	125	235	155	164	165	144	163
11. Takalar	543	630	435	235	389	661	757	952
12. Gowa	904	367	484	551	1,583	1,182	757	627
13. K.M.U.Pandang	-	-	-	-	35	-	-	-
14. Maros	1,091	-	170	256	155	70	56	59
15. Pangkep	478	106	188	251	445.25	250	466	278
16. Barru	2,050	3,104	2,410	1,491	3,731	1,070	1,391	1,110
17. K.M.Pare2	875	1,560	600	355	1,147	497	178	307
18. Sidrap	190	130	153	165	174.70	251	158	33
19. Enrekang	1,479	1,893	302	98	57	169	429	250
20. Pinrang	243	36	101	144	175	139	140	61
21. Polmas	5,485	388	2,491	1,399	1,399	1,291	523	2,733
22. Majene	2,345	2,564	2,225	1,254	1,254	705	2,432	1,560
23. Mamuju	6,290	4,135	5,750	5,553	5,553	6,330	5,814	5,923

2) Fluctuation of harvest areas.

9009. The acreages of harvested areas is sometimes larger the acreage of planted areas, because on December 31 each year there is carry-over of unharvested areas from the previous year and it increases the acreage of planted areas for the following year. Thus the acreage of planted areas each year consists of the harvested areas plus the acreage of the areas which carries over.

9010. The average acreage of harvested areas during the Pelita (1969-1976) is 496,000 ha. which consists of:

- a) Rendengan : 374,000 ha.,
- b) G a d u : 89,000 ha., and
- c) G o g o : 33,000 ha.

Compared to the acreage of harvested areas in 1969, the acreage of during the Pelita turned out to have decreased by 4%, i.e. from 517,000 ha. to 496,000 ha. There was an unsteady and fluctuating developments due to a decrease in the acreage of harvested areas in 1972 by 24%, so it decreased to 379,000 ha. and by 8% in 1974 that it became 457,000 ha.

9011. The fluctuation mentioned above was due to the following causes:

a) a fluctuation of the acreage of wet seasonal harvested areas, which decreased from 412,000 ha. to 374,000 ha. (in 1969) compared to the average acreage of harvest from 1969 to 1976 which decreased by 10% due to the decrease of acreage of harvest in 246,000 ha., 370,000 ha. and 345,000 ha., and

b) the continuously decreasing acreage of the gogo harvested areas year by year, so that if the acreage of harvest in 1969 compared to the acreage of harvest from 1969 to 1976, there has been a decrease of 35%, or from the amount of 51,000 ha. to 33,000 ha.

9012. Compared to the average acreage of planted during the Pelita, the acreage of harvest during the period is in average only 83%, due to the following reasons:

- a) the average acreage of harvest of Rendengan is only 87%,
- b) the average acreage of harvest of Gadu is only 89% and
- c) the average acreage of harvest of Gogo is only 91%

9013. The developments of the acreage of harvest in cultivation areas by BIMAS/INMAS and non-intensification within two seasonal planting periods is as follows :

a) The percentage of the acreage of harvest in cultivation areas by BIMAS and non-intensification during the period April-September, compared to the acreage of planted areas during the same period in 1974, 1975 and 1976 are respectively as follows:

by BIMAS : 67%, 93% and 68%,  
by non-intensification : 33%, 37% and 41%

b) The percentage of the acreage of harvest in cultivation areas by BIMAS during the period October-March compared to; the acreage of planted areas during the same period in 1974, 1975 and 1976 are respectively as follows:

by BIMAS : 91 %, 78% and 67%.

(see table 9.4).

Table 9.4. The acreage of paddy harvested areas by period and season in South Sulawesi Province (1974-1976)

				Unit: ha.
Y e a r	Program	Wet season	Dry season	Total
<u>(Period Apr.-Sep.)</u>				
1974	BIMAS	20,430	4,967	25,397
	INMAS	4,309	234	4,543
	non-int	19,559	71,542	91,101
1975	BIMAS	29,978	5,527	35,505
	INMAS	8,842	1,523	10,365
	non-int	24,089	83,560	107,649
1976	BIMAS	31,643	2,930	34,573
	INMAS	22,842	3,344	26,186
	non-int	23,821	88,434	112,255
<u>(Period Oct.-March)</u>				
1974	BIMAS	36,271	16,562	52,833
	INMAS	4,912	7,067	11,979
	non-int	130,395	149,379	279,774
1975	BIMAS	30,402	13,913	44,315
	INMAS	11,033	3,630	14,663
	non-int	141,334	214,440	355,774
1976	BIMAS	18,528	24,711	43,239
	INMAS	13,180	13,814	26,994
	non-int.	152,458	134,483	286,941

Table 9.5. Acreeage of the harvested areas of the paddy Gogo by Kabupaten and year in South Sulawesi Province (1969-1976).

Kab.	1969	1970	1971	1972	1973	1974	1975	1976
01. Luw.	8,161	7,441	5,755	3,659	3,272	3,304	3,347	4,466
02. Tbt.	10	4	4	-	2	2	-	13
03. Sop.	2,026	1,666	1,333	240	1,240	973	764	579
04. Waj.	4,027	2,877	5,749	139	1,721	1,300	924	1,646
05. Bon.	11,350	14,749	9,672	1,498	6,937	4,387	4,657	4,544
06. Sin.	733	647	583	66	362	18	43	-
07. Bul.	67	50	164	32	30	-	18	-
08. Sel.	2,239	2,288	2,129	2,093	564	442	458	537
09. Ban.	582	749	298	100	65	-	-	-
10. Tak.	613	413	439	387	555	48	663	734
11. Jen.	571	120	90	150	210	108	158	158
12. Gow.	1,030	538	351	445	1,131	998	1,136	-
13. U.P.	-	-	-	-	-	-	-	-
14. Mar.	958	75	170	256	165	59	62	27
15. Pan.	477	106	185	205	487	247	363	362
16. Bar.	2,423	2,337	2,377	2,498	3,671	672	1,046	288
17. P.P.	925	760	800	852	977	393	400	1,069
18. Sid.	173	110	153	31	163	233	176	14
19. Ebr.	1,431	1,548	554	27	140	114	410	223
20. Pin.	148	276	54	91	167	37	159	83
21. Pol.	5,273	4,695	3,500	1,969	3,050	988	985	303
22. Maj.	2,279	2,372	2,257	2,198	1,970	1,248	1,954	990
23. Mam.	5,074	6,019	5,137	3,557	6,236	5,266	6,024	5,451
Tot.	50,610	49,840	41,754	20,493	33,115	20,493	23,748	22,197

3) The condition of damage of paddy cultivation.

9014. The average acreage of damaged areas in planted areas during the Palita (1969-1976) is 67,000 ha., consisting of :

- a) the area of Rendengan : 55,000 ha.,
- b) the area of Gadu : 10,000 ha. and
- c) the area of Gogo : 3,000 ha.

The damaged areas mentioned above consist of damages caused by :

Drought	: 30%
Flood	: 6%
Mice	: 19%
Stem-grating pests	: 24%
Others	: 21%
Total	: 100%

9015. Compared to the damaged acreage in 1969, the average of damage acreage during the Palita has increased by 54%. i.e. from 44,000 ha to 68,000 ha. This is caused by the following reasons :

- a) an increase the average of damaged acreage in the area of Rendengan by 44%, i.e. from 38,000 ha. to 55,000 ha.,
- b) an increase of the average of damaged acreage in the area of Gadu by 33%, i.e. from 3,000 ha. to 10,000 ha. and
- c) an increase in the damaged acreage in the area of Gogo by 50%, i.e. from 2,000 ha. to 3,000 ha.

9016. Compared to the damaged areas in the period April-September 1974, the average of damaged acreage during the last three years (1974-1976) in the same period by cultivation ways (by BIMAS/INMAS and Non-intensification) are :

- a) BIMAS areas decreased by 5%, from 29,000 ha. to 19,000 ha.,
- b) INMAS areas increased by 25%, from 4,400 ha. to 5,800 ha., and
- c) Non-intensification areas decreased by 18%, from 62,500 ha. to 52,800 ha.

9017. In the period October-March 1974, those percentages and acreages are as follows :

- a) BIMAS areas increased by 32%, from 4,100 ha. to 6,000 ha.,
- b) INMAS areas increased by 16%, from 4,000 ha. to 4,700 ha., and
- c) Non-intensification areas increased by 6%, from 27,500 ha. to 29,300 ha. (see table 9.6).

9018. The way of the increase of the harvest area can be taken two ways, (1) increasing the planted areas and (2) reducing the damaged areas.

Table 9.6. The acreage of damaged areas by period and season  
in South Sulawesi Province (1974-1976)

		Unit : ha.		
Y e a r		Wet season	Dry season	Total
<u>(period Ap.-Sep.)</u>				
1974	BIMAS	1,188	28,124	29,312
	INMAS	1,165	3,185	4,350
	non-int.	3,545	58,959	62,504
1975	BIMAS	527	6,313	6,840
	INMAS	803	664	1,467
	non-int.	4,264	11,774	16,038
1976	BIMAS	3,536	18,601	22,137
	INMAS	2,737	8,826	11,563
	non-int.	7,725	72,235	79,960
Average	BIMAS	1,750	17,679	19,429
	INMAS	1,568	4,225	5,793
	non-int.	5,178	47,656	52,834
<u>(Period Oct.-Mar.)</u>				
1974	BIMAS	3,084	1,015	4,099
	INMAS	3,858	133	3,991
	non-int.	18,755	8,786	27,541
1975	BIMAS	1,522	1,179	2,701
	INMAS	3,593	492	4,085
	non-int.	20,033	8,946	28,979
Average	BIMAS	4,312	1,734	6,046
	INMAS	3,928	815	4,743
	non-int	21,199	8,087	29,286

4) Production and yield of paddy/rice

9019. The average production of rice during the Pelita (1969-1976) is 1,181,000 tons, consisting of :

- a) production of the Rendengan : 897,000 tons,
- b) production of the Gadu : 250,000 tons and
- c) production of the Gogo : 34,000 tons

Compared to the production in 1969, the average production has increased by 21%, i.e. from 971,000 tons of rice.

9020. There is an unsteady and fluctuating developments due to a long dry season and the attack of stem-perforating pests in 1972 and the attack of "tungro" and drought in 1974. It contributed to the decrease in production by 20% in 1972 and 17% in 1974 compared to the average production.

9021. The developments of production in 1975 and 1976 is quite encouraging. If the production obtained in 1969 was only 18% beneath the average production, in 1976 it has increased to 18% above the average production, at the amount of 1,404 tons of rice.

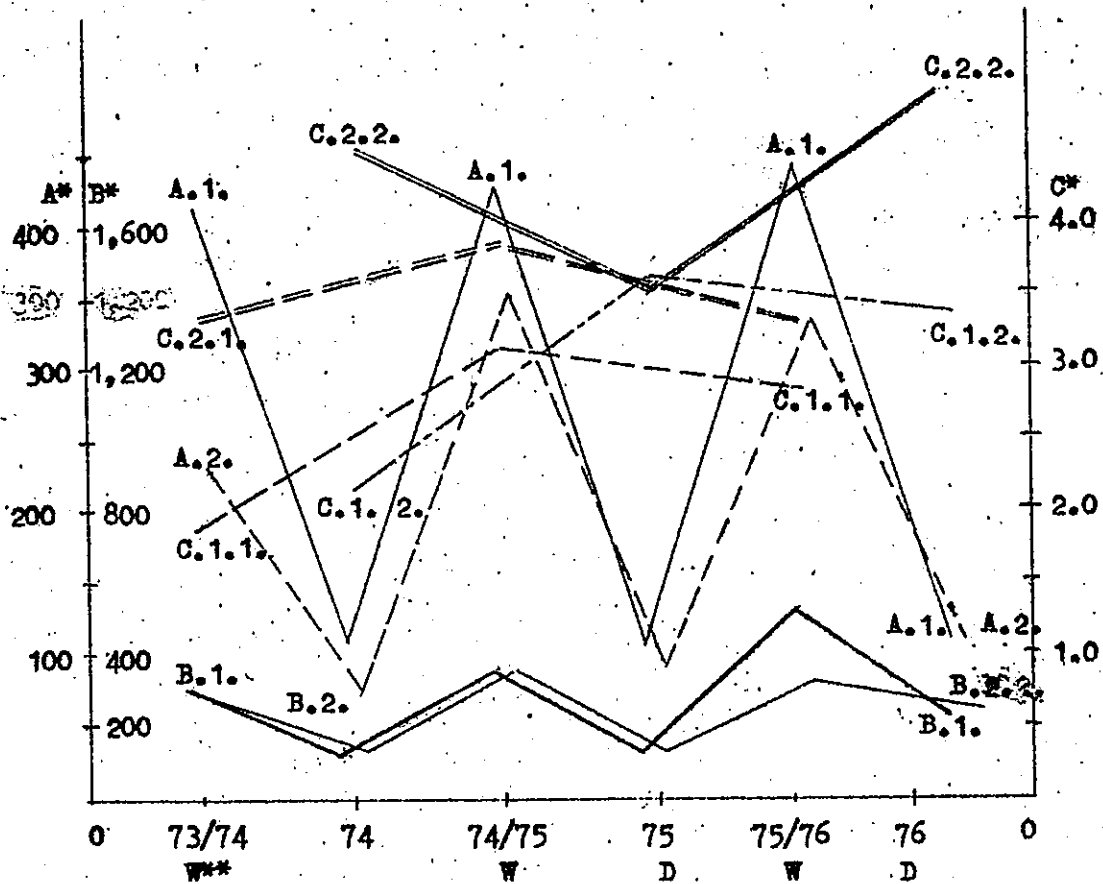
9022. The decrease of production in 1972 and 1974 were much influenced by the production of the Rendengan which decreased sharply while production of the Gadu increased. The production of the Rendengan during the Pelita, where as production of the Gadu during the Pelita and 6% lower in 1974.

9023. In total view, compared to the average production during the Pelita, the production of the Rendengan and the Gadu obtained in 1969 have increased respectively by 12% and 106% i.e. respectively from 798,000 tons and from 121,000 tons to 250,000 tons. The production of the Gogo has decreased from 52,000 tons to 34,000 tons or 34%.

9024. The increase of the production of the Rendengan is only supported by the increase in productivity (15%) due to the decreasing of harvested area. While the increase of the production of the Gadu is besides supported by the increase of harvested area also supported by the 33% increase of productivity.

9025. The average yield of the Gadu is shown about 2,7 t./ha. of dry stalk paddy, and average yield of the Rendengan is estimated as 3.1.t./ha. In the activities of BIMAS/INMAS, it is expected to high yield compare with cultivation of non-intensification. But the average yield by BIMAS/INMAS is not so different from its by non-intensification way. In the wet season, the difference of average yield tend to be small year by year. On the contrary, in the dry seasons, the clear differences can be seen excepting the case in 1975, as shown on figure 9.1 and table 9.7.

**Fig. 9.1. Production and yield of rice by season in South Sulawesi Province ( 1973/1974 - 1976 ).**



Note : \*) A : Planted area (x 1,000 ha)  
 A.1. by non-intensification/A.2. by BIMS/INMAS  
 B : Production (x 1,000 tons)  
 B.1. by non-intensification/B.2. by BIMS/INMAS.  
 C. : Yield : tons/ha.  
 C.1.1. by non-intensification in the wet season.  
 C.1.2. by non-intensification in the dry season.  
 C.2.1. by BIMS / INMAS in the wet season.  
 C.2.2. by BIMS / INMAS in the dry season.

\*\* ) W : the wet season / D : the dry season.

Source : Sekretariat Badan Pembinaan BIMS of South Sulawesi ;  
 Laporan Perincian BIMS/INMAS.



Table 9.7. Production of rice by season (1974-1976)

				Unit: tons.
Y e a r		Wet season	Dry season	Total
<u>Period Apr.-Sep.</u>				
1974	BIMAS	72,913	24,026	96,939
	INMAS	12,398	740	13,138
	non-int.	326,010	213,149	539,159
1975	BIMAS	138,518	27,021	165,539
	INMAS	28,442	5,903	34,345
	Non-int.	531,377	293,875	825,252
1976	BIMAS	149,121	12,052	161,173
	INMAS	92,221	12,350	104,571
	Non-int.	402,283	385,399	787,682
<u>Period Oct.-Mar.</u>				
1974	BIMAS	187,376	84,547	271,923
	INMAS	16,321	26,303	42,624
	Non-int.	337,613	68,718	406,331
1975	BIMAS	151,593	77,570	229,163
	INMAS	38,907	13,450	52,357
	Non-int.	465,682	89,681	555,363
1976	BIMAS	140,986	157,873	298,862
	INMAS	46,252	75,649	121,901
	Non-int.	504,747	82,779	587,526

Source: Sekretariat Badan Pembina BIMAS Prop. Dati I Sulsel  
(Laporan Perincian BIMAS-INMAS).

Table 9.8. Production of the paddy gogo by Kabupaten and year in South Sulawesi Province (1969 - 1976).-

Unit: tons.

1. Luw.	8,841	10,417	8,057	5,199	3,397	5,275	4,540	7,425
2. Tat.	12	6	4	-	2	2	-	16
3. Sop.	2,732	3,333	1,578	399	2,454	1,175	1,241	822
4. Maj.	8,064	7,482	12,538	192	3,816	2,351	1,925	3,561
5. Bon.	10,641	13,705	10,766	564	8,448	4,178	1,675	6,345
6. Sin.	1,242	568	918	50	617	18	57	-
7. Dul.	101	75	259	44	45	-	38	-
8. Sel.	3,482	3,758	3,816	3,816	3,401	497	513	677
9. Ban.	1,259	1,625	679	176	106	-	-	-
10. Jen.	857	156	108	225	273	127	205	185
11. Tak.	1,042	735	876	790	1,116	118	1,034	1,583
12. Cow.	1,854	1,420	623	817	2,073	1,965	2,920	1,201
13. U.P.	-	-	-	-	-	-	-	-
14. Mar.	1,341	158	366	407	379	126	139	62
15. Pan.	477	117	315	349	709	353	762	865
16. Bar.	3,392	2,804	2,964	3,387	3,215	635	1,389	1,601
17. P.F.	1,984	1,432	1,316	1,278	1,397	411	340	346
18. Sid.	260	165	239	31	168	148	105	10
19. Bar.	1,431	1,548	1,108	54	183	138	467	251
20. Pin.	266	497	130	226	297	69	170	89
21. Pol.	7,909	7,043	4,474	2,560	3,961	1,284	1,252,20	339
22. Maj.	3,191	3,321	4,063	4,396	3,940	2,496	3,908	2,005
23. Man.	8,118	5,417	6,264	2,846	6,790	5,266	6,232	5,547
Tott.	68,498	65,786	61,561	27,397	44,024	26,641	31,920	32,930

5) Improvement for high production.

9026. There is still an average acreage of 16% of the whole paddy fields which are not cultivated in the wet season, or 32,000 ha., additionally the acreage which can only be planted with Gadu, which is only 11% or an acreage of 25,495 ha. of the total of 213,967 ha.

9027. By improvement of the tertiary and quaternary channel network system and good coordinations of irrigation water use in the wet season, the area of Mendengan can be increased.

9028. Meanwhile the expansion of the Gadu area, which supports the increase of harvest area, must be accompanied by the forestation of catchment areas and it will be only successful when accompanied by an integrated counselling.

9029. In the east coastal area of the Province, there is still 25% of the whole paddy fields which is not planted in the wet season, or an acreage of 71,000 ha., besides that which can only be planted with the Gadu, i.e. 28% of 84,927 ha. of the whole of 294,851 ha.

Anyhow other productive elements that could be counted improvement of paddy production should be described on the following items:

a) Condition and availability of labor force.

9030. South Sulawesi Province in 1976 has a population of 5,654,002 persons, consisting of 66,74% of persons above 10 years of age, i.e. 3,774,015 persons as labor force and remaining 33,2% or 1,880,787 persons is non-labor force. The employment in the labor force is 40,82% or number of 1,540,553 persons (Census 1971; BPS) and 66,33% or a number of 1,021,849 persons of the employment is occupied in agricultural sector.

The acreage of agricultural lands is 1,345,663,92 ha., according to the South Sulawesi Agricultural Extension Service (see table 9.9. and 9.10).

9031. b) Pesticides; during the Pelita I and II, the prevailing pesticides used in over-coming the attack of pests and diseases including the gulma is the insecticides. The use of fungicides and herbicides in the using insecticides thus far is as follows:

i) during the Pelita I the use of pesticides (insecticides and rodenticides) has increased by 50.1%, the average of annual increase being about 12,6%

- ii) during the Pelita II the use of pesticides increased by 173.20% where the annual increase is around 57.73%, and
- iii) during the few years in the begin the Pelita II, the use of herbicides is apparent in a few Kabupaten-s Sidrap and Pinrang (see table 9.11 and 9.12).

c) Seedling and seeds.

9032. It is realized that during the Pelita I and II high variety seeds for the commodities of paddy, secondary crops and vegetables have prevailed by means of the Agricultural Extension Service. Up to 1977, the high varieties recorded well is for paddy. The use of high variety seeds (Unggul Baru and Unggul Bogor) during the Pelita I has increased by approximately 172.3%, with the annual rate of increase about 42.77%. For 1976-1977 the use of high variety seeds is recorded as follows :

Unggul Baru	334,993.49 ha., and
Unggul Bogor	66,987.74 ha.

The average use of high variety seeds annually during the Pelita II is as follows :

Unggul Baru	251,813.33 ha., and
Unggul Bogor	60,029.58 ha.

(see table 9.13 and 9.14).

d) Progress of the use of agricultural machineries  
(see table 9.15).

9033. i) Machineries for land cultivation: The use of agricultural machineries which consists of power tillers, mini-tractors and tractors, during the Pelita II, are recorded (the numbers in 1977) as follows :

Power tillers	29 units,
Mini-tractors	508 units and
Tractors	71 units.

9034. ii) Machineries for pest and disease control: The elimination of pests, disease and gulma is conducted by the use of hand sprayers, power sprayers (high volume) and mist blower (low-volume). The development, provision and use of those machineries until 1977 have been recorded as follows :

Hand sprayers	1,451 sets,
Power sprayers	248 sets and
Mist blower	571 sets.

9035. iii) Machineries/equipments for processing: The main equipments used for paddy processing, which have been used during the Pelita II of the previous years, consist of trashers, rice milling units (RMU), dryers and cleaners. The progress of the use during the Pelita II is recorded as follows :

Rice milling units	4,172 units,
Dryers	7 units and
Cleaners	9 units.

9036. iv) Others : Water pumps and transplanter have started to be introduced during the Pelita II. 39 units of 4 inches water pumps are used up to 1977, and only 1 unit of transplanter.

Table 9.9. Condition of the employed by age group in agricultural Sector in South Sulawesi Province (1976)

Age group	Percentage by Census 1971	The employed in whole sector	The employed in agricultural sec.
1. 10 - 14	5.35	82,420	54,669
2. 15 - 19	12.10	186,407	423,644
3. 20 - 24	11.71	180,399	119,659
4. 25 - 29	15.14	233,240	154,708
5. 30 - 34	11.96	184,250	122,213
6. 35 - 39	13.60	209,515	138,972
7. 40 - 44	9.04	139,266	92,375
8. 45 - 49	7.26	111,844	74,186
9. 50 - 54	5.30	81,649	54,158
10. 55 - 59	2.87	44,214	29,327
11. 60 - 64	2.79	42,981	28,509
12. 65 - 69	1.36	20,952	13,897
13. 70 - 74	0.97	14,943	9,912
14. 75	0.55	8,473	5,620
<b>T o t a l:</b>	<b>100.00</b>	<b>1,540,553</b>	<b>1,021,849</b>

Source : Perkiraan Masalah Pembangunan Pertanian Propinsi Sulawesi Selatan dalam Pelita III.-

Table 9.10. Estimation and number of labor employment  
in the South Sulawesi Province by region  
in 1961 and 1971 - 1978.-

Y e a r	Labor Force 35.90% L.F.	Rural 86.64% L.F.	Urban 13.36% L.F.
1961	1,621,439	1,404,815	216,624
1971	1,861,934	1,613,180	248,754
1972	1,888,351	1,636,067	252,284
1973	1,914,693	1,658,890	255,803
1974	1,941,403	1,682,032	259,371
1975	1,963,486	1,705,496	262,990
1976	1,995,348	1,729,388	266,650
1977	2,023,790	1,753,412	270,378
1978	2,052,031	1,777,871	274,150
1979	2,080,647	1,802,673	277,974
1980	2,109,672	1,827,820	281,852
1981	2,139,102	1,853,318	285,784
	1,395 %	1,395%	1,395%

Based on the table above, projection of labor employment by rural and urban areas will obtain numbers as shown on the table on next page.

Table 9.11. Development of the use of fertilizer in the South Sulawesi Province during the periods 1969-1970 through 1976 - 1977.

No.	Year	Urea (kg)	TSP/DAP (kg)	Total (kg)	Index
1.	1969 - 1970	4,320,321	1,614,213	5,934,534	100
2.	1970 - 1971	4,245,586	1,111,025	5,356,611	51.8
3.	1971 - 1972	3,261,840	1,330,437	4,592,277	77.4
4.	1972 - 1973	10,160,863	3,603,901	13,764,764	231.9
5.	1973 - 1974	7,746,605	1,998,906	9,745,511	164.2
6.	1974 - 1975	9,446,146	3,297,017	12,743,163	214.8
7.	1975 - 1976	9,353,799	4,610,390	13,964,189	235.4
8.	1976 - 1977	12,826	4,664,692	17,490,858	294.7

Source : Inspeksi Dinas Pertanian Rakyat Propinsi Sulsel.-

Table 9.12 Development of the use of pesticides in the South Sulawesi Province during the periods 1969 - 1970 through 1976 - 1977.

No.	Period	Insecticide kg/ltr	Index	Rodenticide kg	Index	Total	Index
1.	1969 - 1970	61,863	100	3,520	100	65,383	100
2.	1970 - 1971	33,520	54.2	352	10	33,872	51.8
3.	1971 - 1972	22,087	35.7	1,017	28.9	23,104	35.3
4.	1972 - 1973	109,098	176.3	3,648	103.6	112,746	172.4
5.	1973 - 1974	93,026	150.4	5,123	145	98,149	150.1
6.	1974 - 1975	134,640	210.6	3,661	134	138,301	207.5
7.	1975 - 1976	127,424	206	3,111	113.8	130,535	199.6
8.	1976 - 1977	205,075	331	6,321	179.5	211,396	323.3

Table 9.13. Development in the use of top variety seeds during the Pelita I and Pelita II in South Sulawesi Province.

<u>Pelita I.</u>						
<u>Y e a r</u>	<u>Acreage of Top Variety Crops (Ha)</u>			<u>I n d e x</u>		
	<u>Unggul Baru</u>	<u>Unggul Bogor</u>	<u>Total</u>	<u>Unggul Baru</u>	<u>Unggul Bogor</u>	<u>Total</u>
1969-1970	30,034.00	117,568.00	147,602.00	100	100	100
1970-1971	167,987.76	120,264.85	288,252.69	559.9	102.3	195.3
1971-1972	95,822.34	62,882.10	158,704.44	319.0	53.5	107.5
1972-1973	179,220.22	94,234.95	273,455.17	596.7	80.1	185.3
1973-1974	247,911.22	98,363.58	346,274.80	825.4	83.7	234.6
Average	144,195.22	98,662.69	242,857.80	100	100	100
<u>Pelita II.</u>						
1974-1975	192,494.58	72,746.50	265,241.08	640.9	61.9	179.7
1975-1976	227,951.87	40,354.31	268,306.28	759	34.3	181.8
1976-1977	334,993.49	66,987.94	401,981.43	1,115.3	56.9	272.3
Average	251,813.33	60,987.94	311,842.91	174.6	60.8	128.3

Source : Inspeksi Dinas Pertanian Rakyat Propinsi Daerah Tingkat I Sulsol.- Perkiraan masalah Pembangunan Pertanian Tanaman Pangan.



Table 9.14. Percentage of the use of top variety rice crops  
in the acreage of crops in South Sulawesi Province.

Pelita I.

<u>Y e a r</u>	<u>Total acreage of crops (ha)</u>	<u>Acreage of top variety Crops (ha)</u>	<u>Percentage (%)</u>
1969-1970	556,366.00	147,602.00	25.52
1970-1971	556,339.06	288,252.69	51.81
1971-1972	605,352.00	158,704.44	26.22
1972-1973	445,251.25	273,445.17	61.41
1973-1974	629,043.01	346,274.80	55.04
Average	538,043.01	242,857.80	43.48

Pelita II.

1974-1975	554,096.62	265,241.08	47.87
1975-1976	566,024.84	268,306.28	47.40
1976-1977	609,124.61	401,981.43	65.99
Average	576,415.36	311,842.93	54.10

Source : Inspeksi Dinas Pertanian Rakyat Propinsi Daerah  
Tingkat I Sulsel.

Perkiraan masalah Pembangunan Pertanian Tanaman Pangan  
(Estimation of Food Crop Agriculture Development  
Problems).-

Table 9.15. Developments in using the agricultural machinery in South Sulawesi Province (1973-1977).-

No.	K i n d	1973		1974		1975		1976		1977	
		(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
<b>I. <u>Tractor</u></b>											
	a. Power Tillor	18	18	25	25	29	27	29	23	29	119
	b. Mini Tractor	-	-	42	42	100	100	251	251	508	508
	c. Tractor	62	62	62	62	-	73	78	71	71	-
<b>II. <u>Sprayer</u></b>											
	a. Hand Sprayer	7,040	3,500	7,340	4,025	7,361	4,516	7,451	4,606		
	b. Mist Blower	-	-	10	10	120	110	557	508	571	496
	c. Power Sprayer	348	300	348	225	248	250	348	250	248	78
<b>III. <u>Water Pumps (4")</u></b>											
		25	25	34	34	34	28	38	34	39	33
<b>IV. <u>Transplanter</u></b>											
		-	-	-	-	-	-	-	-	1	1
<b>V. <u>Tresher</u></b>											
		15	15	46	46	51	51	51	51	51	45
<b>VI. <u>Rice Milling Unit</u></b>											
		2,673	-	3,327	-	3,541	-	4,172	-	-	-
<b>VII. <u>D r y e r</u></b>											
		7	7	7	7	7	7	7	7	7	7
<b>VIII. <u>Cleaner leaner</u></b>											
		9	9	9	9	9	9	9	9	9	9

Note : (1) Total number

(2) Number of good condition's machine among the Total number

Source: Inspeksi Dinas Pertanian Rakyat Propinsi Dati I Sulsel.-

9.1.2. Cropping intensity and secondary crops

1) Tendency of cropping intensity.

9037. The cropping intensity by crop in South Sulawesi is as follows :

	Area planted	Cropping intensity
a) <u>Food crops</u>		
Total extent of paddy field	509,000 ha	100 %
Wetland paddy	448,000	88.2
Gadu paddy	114,000	22.4
b) <u>Upland crops</u>		
Total extent of upland field	909,000 ha	100%
C o r n	286,000	31.5
Upland paddy	26,000	2.9
Other upland crops	221,000	24.3
Industrial crops	206,000	22.6
c) Total cropping intensity		
P a d d y	562,000	39.6
Upland crops	739,000	52.1
T o t a l	1,301,000	91.7

9038. The cropping intensity in the upland fields in South Sulawesi was 81% in 1976. Although most crops other than secondary crops are increasing, such as shown in table 9.16, Fig.9.1., farmers hope to expand production of cash crops such as coffee, tobacco and spices and secondary crops are replaced by such crops. However, the tendency of decrease in cultivated areas is an important problem for agricultural development (Refer to Fig. 9.2.). Particularly the yield of secondary crops except peanut per ha. declines today, and consequently the total volume of secondary crops is decreasing.

9039. It should be noted that the cultivated area has been on the decrease in the past years, whereas farming population has been on the increase. As a result, the cultivated area per farming family has become smaller through division among father and son, brothers and other family members. And more and more farmers cannot afford cultivated land. These farmers either go to cities to find jobs as seasonal laborers or go to Java island or other parts of the country.

If agricultural production is to expand in line with the growth in other industries, the expansion of secondary crops should be implemented, because it will not be possible to catch up with the population growth through the increase of rice production only. It is especially necessary to increase the yield per ha. of crops, so farmers will produce more secondary crops. In the present case of secondary crops, in spite of the rise in secondary crop prices, there is no increase of profit for the farmers.

9040. The following measures should be taken, not only concerning secondary crops:

- 1) increasing yield per ha. especially of secondary crops, and proper varieties of it should be selected, while improvements of the system of land utilization, crop rotation and soil fertility should be conducted.
9041. ii) selection of high value species to be developed, such as white corn, and improvement of its production method.
9042. iii) improvement of agricultural marketing: a study on the marketing system of upland crops should be conducted to encourage the development of less developed rural areas. Afterwards the various rural credit programmes currently being operated should be coordinated and also be consolidated so that farmers of underdeveloped areas can use the credit.

2) Main secondary crop production.

9043. Corn, cassava and beans are usually planted in the dry season as annual secondary crops, and they are planted on an area extending about 480,000 ha. The total acreage planted is taken into account as the area for intercropping and mixed cropping among trees such as kapok, banana and mango.

Table 9.16. Acreage planted to secondary crops in South Sulawesi (1976).-

Kind of crop	Acreage planted	
	000 ha.	%
C o r n	286	59.7
Peanut	57	11.8
B e a n s	57	11.8
Cassava	36	7.6
Upland paddy	27	5.5
Sweet potato	11	2.3
Horticulture	6	1.3
T o t a l	480	100.0

C o r n

9044. Corn is the primary crop of South Sulawesi as it occupies the greatest part of the planted area in the province; from 1969 to 1976 the average extent of area planted to corn was 245,430 ha., the production was 169,278 tons and the average yield was 690 kg per ha. The leading kabupaten-s in corn production were Jeneponto, Bone and Bulukumba.

Table 9.17. Corn production in South Sulawesi

	Area planted		Yield kg/ha.
	000 ha.	%	
1969	321.4	100	669
1975	163.8	51.0	653
1976	286.4	89.1	403
Average (1969-'76)	245.4	76.4	690

P e a n u t

9045. Peanut is a more important cash crop among secondary crops, being exceeded by cassava and beans only. Peanut was grown in South Sulawesi during the period from 1969 through 1976. The annual production was about 18,913 tons while the average yield was 621 kg/ha.

9046. The most favourable climatic conditions for peanut are: moderate rainfall during the growing season, abundance of sunshine, and relatively high temperature. The plants need ample soil moisture from the beginning of its blooming until two weeks before harvest.

The cultivated environment exists in the paddy fields, and many people grow peanut along with paddy.

Table 9.18. Peanut production in South Sulawesi.

	Area planted 000 ha.	%	yield kg/ha.
1969	32.3	100	571
1975	32.9	101.9	
1976	56.6	175.4	242
Average	30.4	94.3	621

B e a n s .

9047. Two kinds of beans are cultivated in this province, i.e. soy bean and green gram. Soy bean is one of the oldest cultivated crops; the famous one is that produced in Soppeng. Green gram is the most general crop in tropical countries.

9048. The climatic requirements for the beans are about the same as those for corn. A combination of a high temperature and low precipitation is generally favourable. The beans grow on nearly all types of soil, but they are especially productive on fertile loam. They are better adapted to low fertility soils than corn, provided the proper nitrogen fixing bacteria are present.

9049. In South Sulawesi, an average of 33,009 ha. of green pea and 8,011 ha. of soy bean were planted each year, producing 13,317 tons of green gram and 4,221 tons of soy bean, with an average yield of 393 kg. per ha. of green gram and 527 kg/ha. of soy bean.

Table 9.19. Production of beans in South Sulawesi

	Area planted 000 ha.	%	Yield kg/ha.
1969	50.2	100	411
1975	34.3	68.3	396
1976	56.9	113.3	271
Average	41.9	83.4	418

C a s s a v a

9050. Cassava is one of the tuber crops and the important staple food crop in upland areas. Cassava is grown on an area extending 39,582 ha. and used chiefly for food. The average production is about 274,443 tons, some of which is used as material for preparing tapioca, which is traded with other countries.

Table 9.20. Cassava production in South Sulawesi

	Area planted 000 ha.	%	Yield kg/ha.
1969	49.0	100	6,953
1975	31.5	64.1	7,299
Average	39.6	80.7	6,934

Sweet potato

9051. Sweetpotato was planted at about the extent of 11,854 ha. annually from 1969 to 1976 in South Sulawesi. Its production exceeded 51,553 tons, while the average yield was 4,349 kg/ha. Sweet potato is mostly grown on sandy loam soil. A sandy soil with a clay subsoil is desirable, but good yields are obtained in very sandy soil types. Rotation and multiple cropping with other crops such as corn, cassava and beans are helpful in sweet potato production.

Table 9.21. Sweet potato production in South Sulawesi.

	Area planted 000 ha.	%	Yield kg/ha.
1969	13.1	100	6,075
1975	8.4	64.1	4,933
1976	11.0	84.0	3,185
Average	11.9	90.3	4,349



9.1.3. Change of the demand structure and the regional production structure.

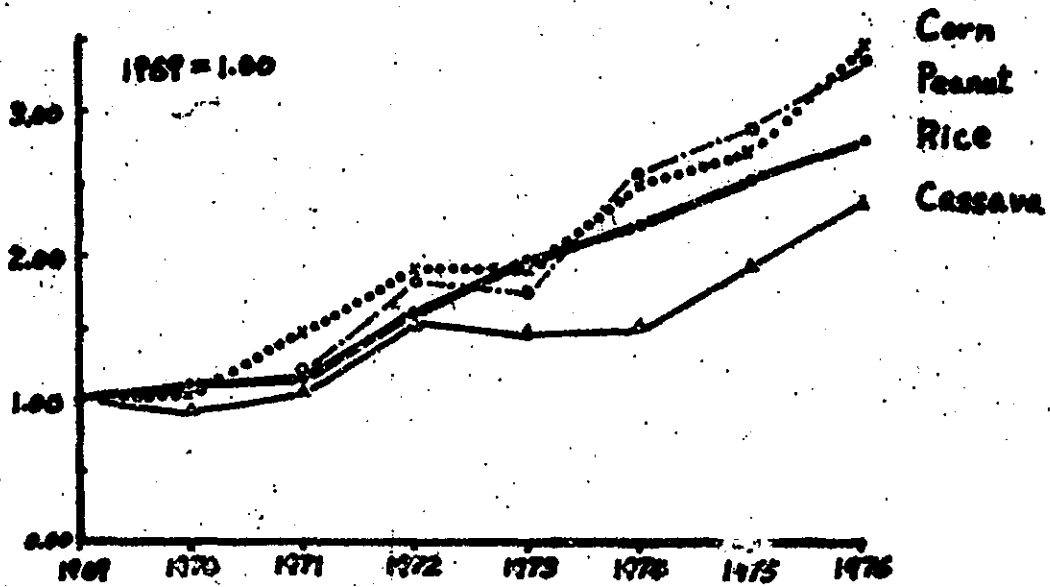
9052. Rice production keeps increasing in percentage among food stuff production in South Sulawesi, in line with the changing demand structure, as people gradually develop the preference for rice. In spite of the increase in prices of corn and cassava, their production declines. Corn price is particularly increased over that of rice, and though the rate of price increase of cassava is lower than that of corn, decline in cassava production is lower than that of corn, such as shown in the figures 9.2 and 9.4. One of the reasons is shown in Fig. 9.3., i.e. the much bigger gross income from rice as compared with that from other crops.

Table 9.22. Percentages of food stuff production during the period 1964 - 1976.-

Year	Rice	Corn	Cassava	Others	Total
1964	46	29	11	14	100
1965	47	22	16	15	100
1966	44	28	13	15	100
1967	50	21	13	16	100
1968	53	22	11	14	100
1969	55	19	10	16	100
1970	63	15	7	15	100
1971	66	11	7	16	100
1972	60	11	11	18	100
1973	56	23	7	14	100
1974	66	9	10	15	100
1975	70	8	6	16	100
1976	70	9	7	14	100

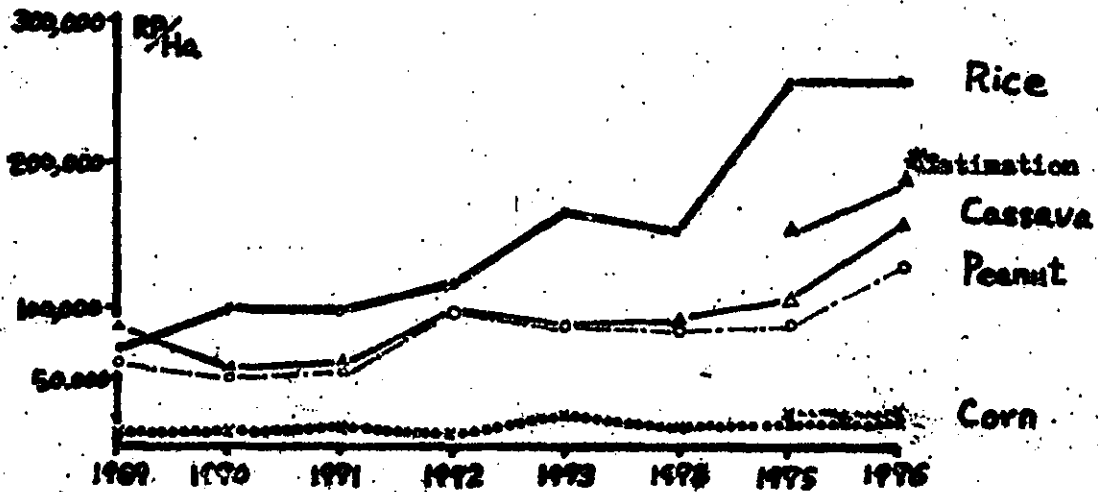
Source : Estimation by the Team.

Fig. 9.2. Fluctuation of Prices by Commodity (1969-1976)



Source: Refer to table II.15-19 of Vol. III.

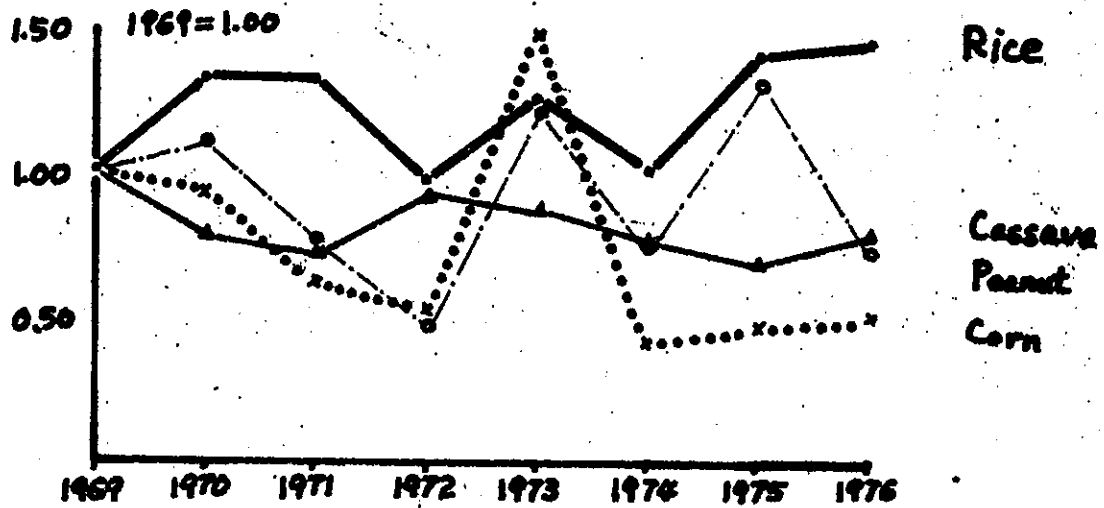
Fig. 9.3. Gross income fluctuation (Rp/ha) by commodity (1969 - 1976/Farmers level)



\* Estimation: if yield per ha. were the same as 1969, farmer would get more income.

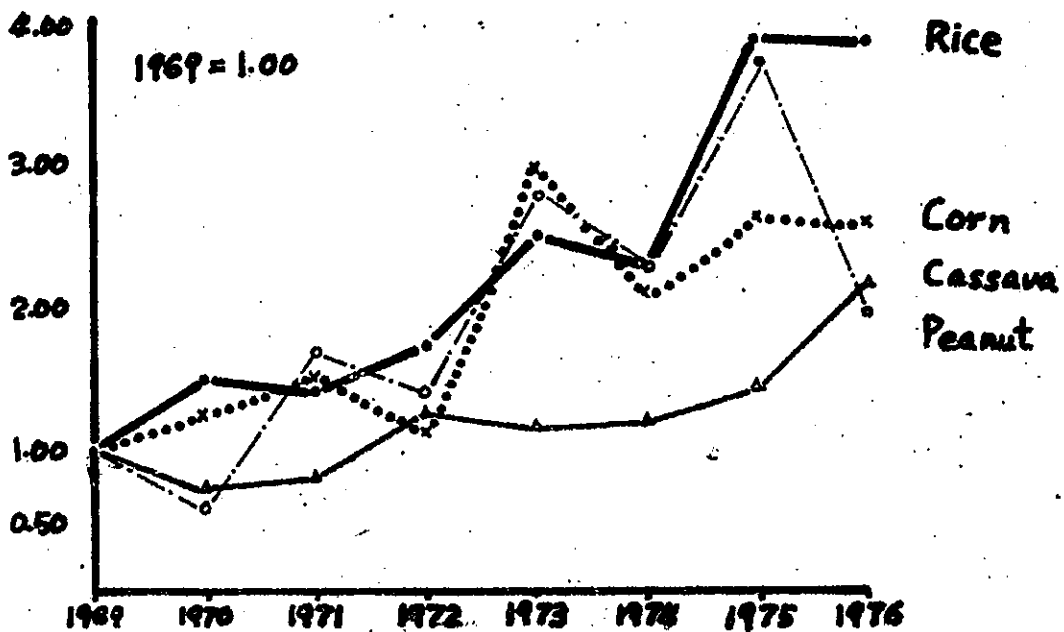
Source: Refer to table II.15-18 of Vol. III.

Fig. 9.4. Trend/Index of Total Volume by Commodity (1969-1976)



Source: Refer to table II.15-18 in Vol. III.

Fig. 9.5. Trend/Index of Farmers Gross Income (1969-1976/ per Ha.)



Source: Refer to table II.15-18 in Vol. III.

9053. According to Fig. 9.5, (the total volume of production by commodity), rice is increasing, corn and cassava are decreasing, while peanut has a different case. For instance, comparing figures 9.4 and 9.5, considerable correlation will be found out concerning peanut. On the other hand, if yield of cassava per ha. did not decline, farmers could get 20% additional gross income from that in 1976, as shown in Fig. 9.3. 1)

9054. Recently, the yield of staple food stuff, except rice, per ha., keeps declining, which is due not only to socio-economic factors but to technical problems as well. The latter is a considerable problem, particularly in marketing, because in export marketing, the shipment of commodities in stabilized quantity and quality is one factor for profitable trading. On the other hand, the annual rate of increase in food production is only 0.3% while the annual rate of population growth is 1.6%.

9055. In the near future, even in the region the food stuff will probably fall into shortage and many infrastructures and a large sum of budget will be required to increase rice production. If farm techniques for other crops will also be raised, and the yield of commodities per ha. will be kept, the budget requirement will not be so large.

#### 9.1.4. Vegetables and fruit

##### 1) Vegetables.

9056. As is commonly known, the climate in the tropics is a continuous summer where the temperature is high throughout the year with very little difference in the photoperiod between the summer solstice and the winter solstice, and with virtually no storms.

9057. The only adversity, if it can be called that way, is a clear distinction between the dry and the wet seasons under the influence of the monsoon depending on the region.

9058. The following is a summary of studies with a comparison of vegetable production between the tropics which is under the influence of such weather conditions as mentioned earlier and the temperature zone (Central Japan).

9059. In Japan which belongs to the temperate zone, there are four seasons, spring, summer, autumn and winter, and the change of season is quite distinct.

- 1) Farmers' income in 1976 was Rp. 156,600. Estimated one was Rp. 187,800. Farmers would get Rp. 31,200 per ha. of gross income.

During the period from spring to summer (frostfree season) such vegetable fruit as eggplant, tomato and cucumber are mainly produced. During the period from early autumn to winter such edible herbs as Chinese cabbage, radish and lettuce are produced. During the period from October to June (rainy season and the beginning of rice planting) such winter crops of paddy fields as onion and cabbage are produced.

9060. In South Sulawesi which belongs to the tropical zone, such crops as lettuce, cabbage, Welsh onion and radish are produced in the highland cool zone with elevation of around 700 m where cool weather is prevalent (Malino, Malakaji in Kabupaten Gowa, Tompobulu in Jeneponto, Manipi in Sinjai), and such vegetable fruit as eggplant, pumpkin, cowpeas and peanuts and tuber crops including sweet potato and red onion are produced barely in the lowland areas (See table 9.23).

9061. However, the cropping season is naturally under the influence of the wet and the dry seasons, and such conditions seem to be the same as in Jakarta and in the Philippines, such as shown in Figures 9.6 and 9.7.

9062. During the period of Dutch occupation the area in vegetables was much greater than it is at present as there was a larger demand for vegetables at a relatively higher price. Even now the income per ha. from vegetables may be several times that from rice. The level of technology in vegetable production is in some cases quite high, with fertilizers and pesticides being used. One problem is the transportation of fresh vegetables to market, since the roads serving the vegetable-producing areas have deteriorated considerably. In addition, market prices for fresh vegetables are not always stable.

Table 9.23. Production volume and main production areas (1976)

Commodity	Production volume 000 ton	Main production area
C a b b a g e	5.07	Enrekang, Jeneponto, Tator
Chinese cabbage	1.83	Tator, Jeneponto, Takalar
T o m a t o	4.81	Soppeng, Wajo, Sidrap
Eggplant	4.73	Wajo, Sidrap, Gowa.
Cucumber	2.71	Takalar, Gowa, Majone
B e a n s	2.86	Wajo, Enrekang, Jeneponto
Spanish papper	5.69	Sidrap, Wajo, Gowa
Onion		
Onion leaves	3.63	Tator, Enrekang, Jeneponto
P o t a t o	3.39	Enrekang, Tator, Bantaeng.

9063. Relations between the elevation and the temperature are such that the temperature drops 0.5 degree for every 100 m in the elevation.

9064. In Japan, the months of July and August experience high temperatures which compare well with the temperatures in the tropics. During this season, however, production of vegetables suitable to each locality by taking advantage of the decrease in the temperature with the increase in elevation is very common. For example, tomato and cucumber which are more or less suited to the cool weather are raised in the semi-highland cool zone with elevations of 200 m to 300 m or 500 m to 600 m and shipped to the market during the period from September to early October.

9065. On the other hand, a study of land use for vegetable production at the foot of mountains and semi-highland cool zone in the tropics revealed that most of the field is monopolized by such enterprise plantations as rubber, coco-palm, quinine and coffee plantations and tea garden and is hardly used for vegetable production by general farmers. In other words, the land use at the foot of mountains and in the semi-highland cool zone, which offer the highest utility value (fertile soil, cool weather, good irrigation), has been closed to general agriculture over a long period of time.

9066. It is very important therefore, that immediate measures are taken to solve a long pending question of vegetable shortage during the wet season, which has been unavoidable in the tropics so far and develop the area of the tropical zone to stabilize the people's livelihood and that the production of vegetables centering on vegetable fruits which are the native of the tropics is commenced under proper guidance and encouragement.

9067. The following figures show the condition of vegetable production suited to each locality by taking advantage of the decrease of temperature with the increase in elevation. Such figures are useful for the proper guidance and encouragement.

## 2) Fruit trees

9068. Although many kinds of fruit are grown in home yards in this province, certain Kabupaten-s are best known for their fruit production. Those include Bantaeng, Jeneponto and Majene in citrus production areas (See table 9.24).

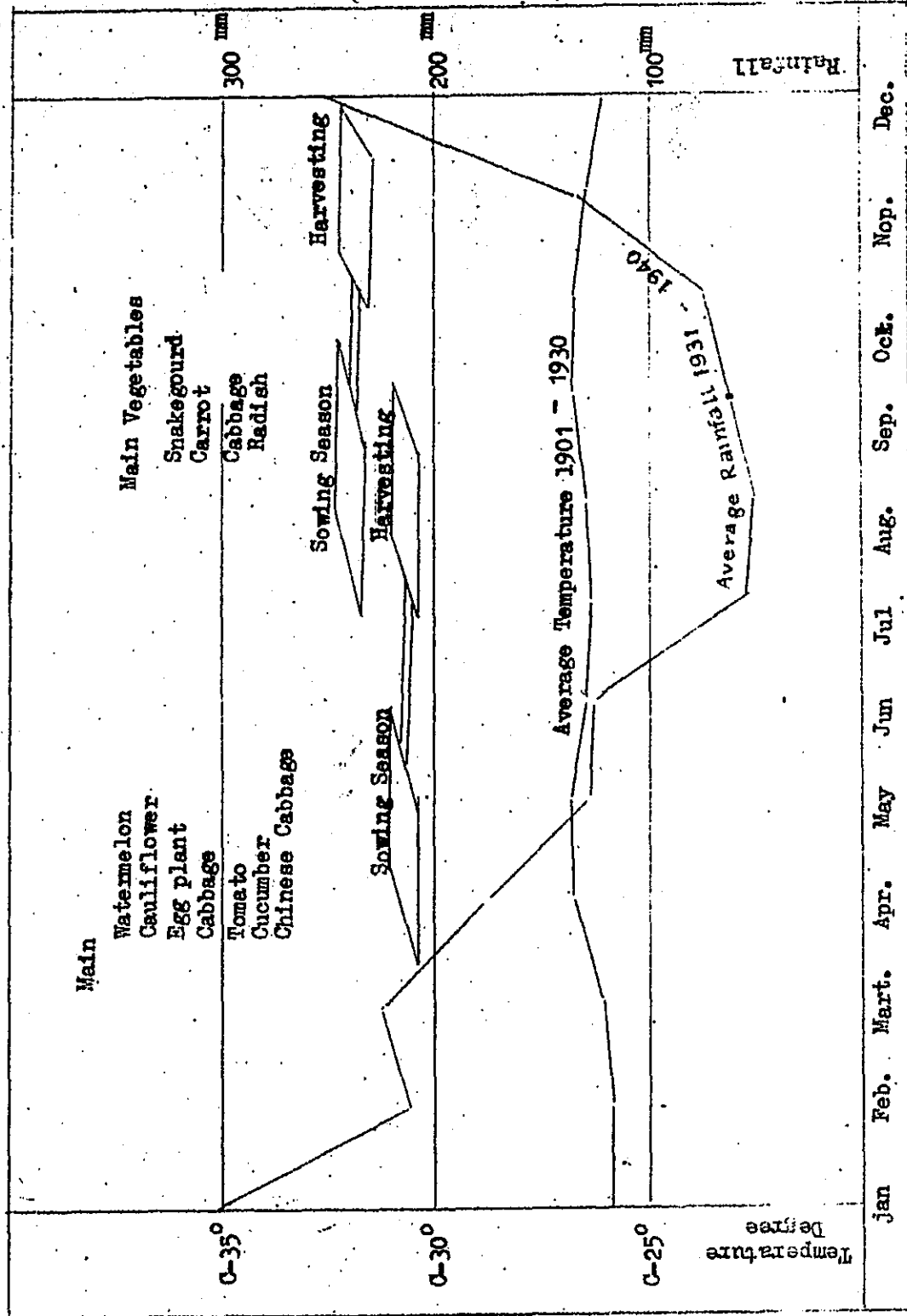
9069. Citrus production is expanding quite rapidly in several Kabupeten-s such as Gowa, Jeneponto, Bantaeng, Majene. The present high prices will perhaps fall after a few years.

9070. Markisa or passion fruit (purple variety is a speciality crop found specifically in Gowa (Malakaji, Malino) and Tana Toraja. This fruit finds a good market as the ingredient for Markisa syrup which is sold throughout South Sulawesi as well as outside the province. There is considerable potential in the province to build up a fruit industry since there are many hilly upland areas which could support fruit trees. However, as with so many other crops, marketing is a problem. One further problem is that the quality is inconsistent since most fruit crops are raised from local varieties and there is little attempt at such management practices as grafting and budding of improvement varieties on old root stock. Citrus has a good potential in the drier areas of the province and citrus cultivation is spreading to other dry areas mentioned above.

Table 9.24. Fruit production volume and its main production areas  
(1976)

Kind of fruit	Production volume 000 ton	Production areas
B a n a n a	71.34	Wajo, Majene, Bulukumba
P a p a y a	5.94	Fangkep, Wajo
O r a n g e	4.17	Selayar, Jeneponto
D u r i a n	5.96	Polmas, Mamaju
M a n g o	32.91	Fangkep, Jeneponto, Polmas
P i n e a p p l e	3.52	Gowa, Pinrang
S a l a c o c	4.25	Enrekang
G u a v a	3.41	P o l m a s .

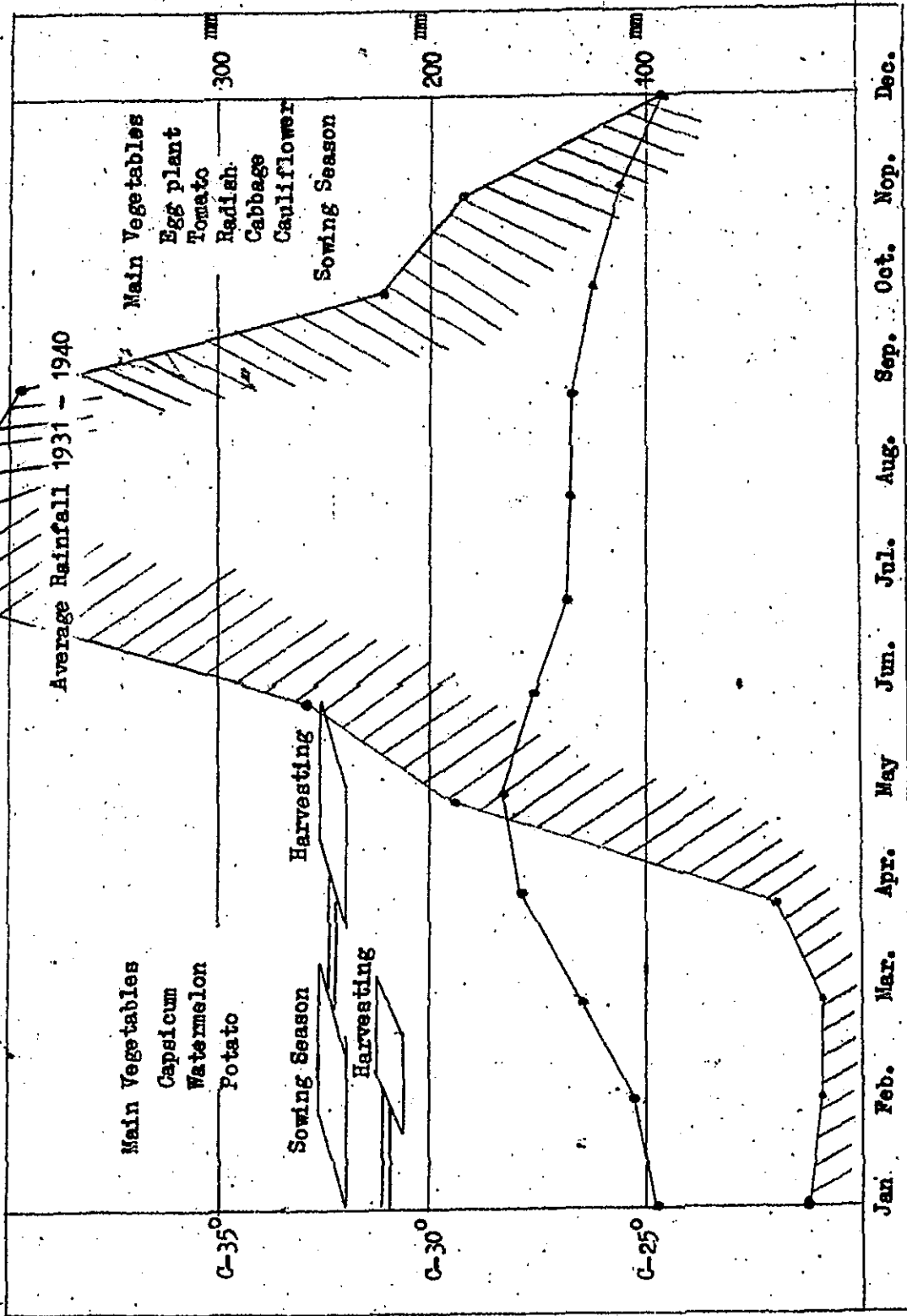
Fig. 9.6. Cultivation season of Main Vegetables with Climate condition (Jakarta)  
 Jakarta in Indonesia



Source : The report of vegetable production  
 in the tropics JICA 1972.

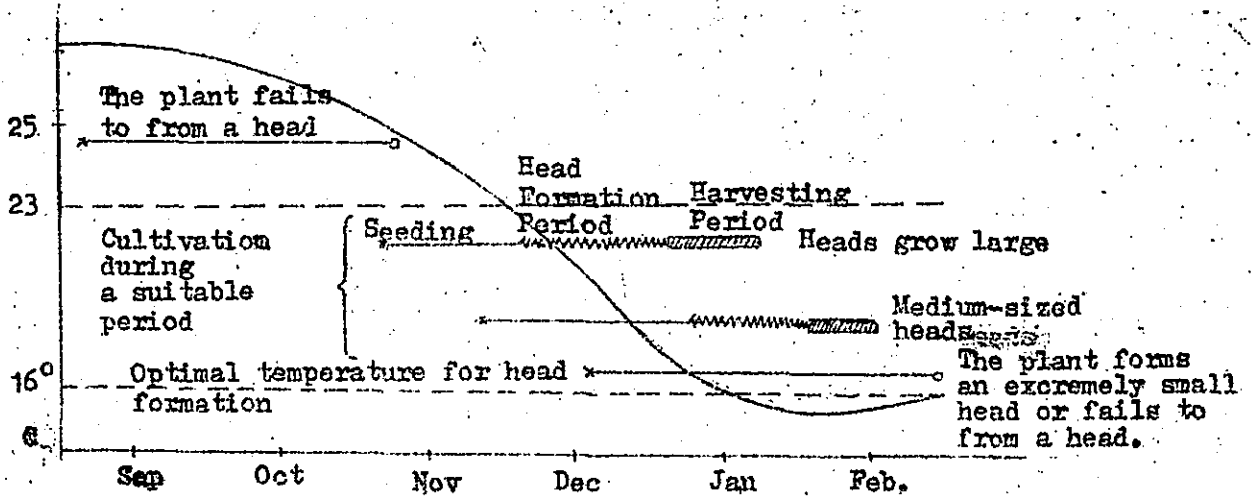


Fig. 9.7. Cultivation season of Main Vegetables with Climate condition (Manila)  
 Manila in Philippines.



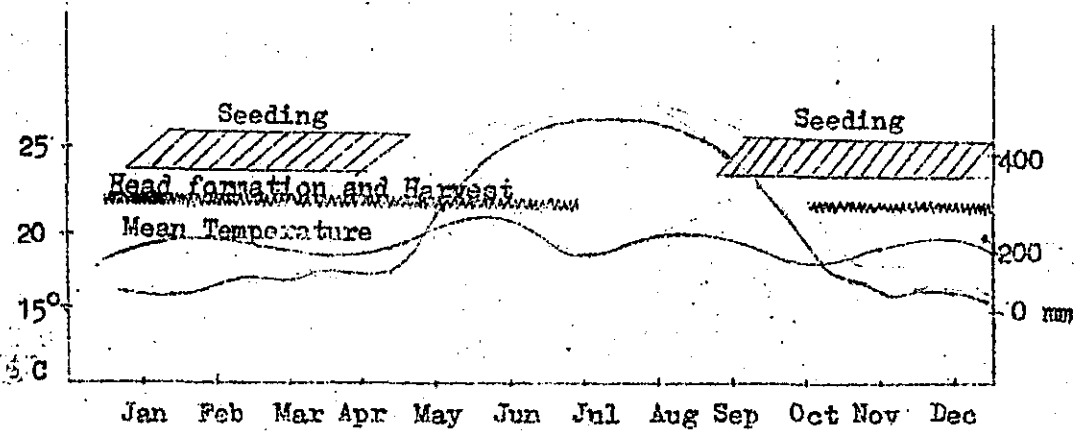
Source : The report of vegetable production in the tropics JICA 1972

Fig. 9.8. Cultivation and Ecology of Chinese Cabbage in the Level Land of the Tropical Zone.



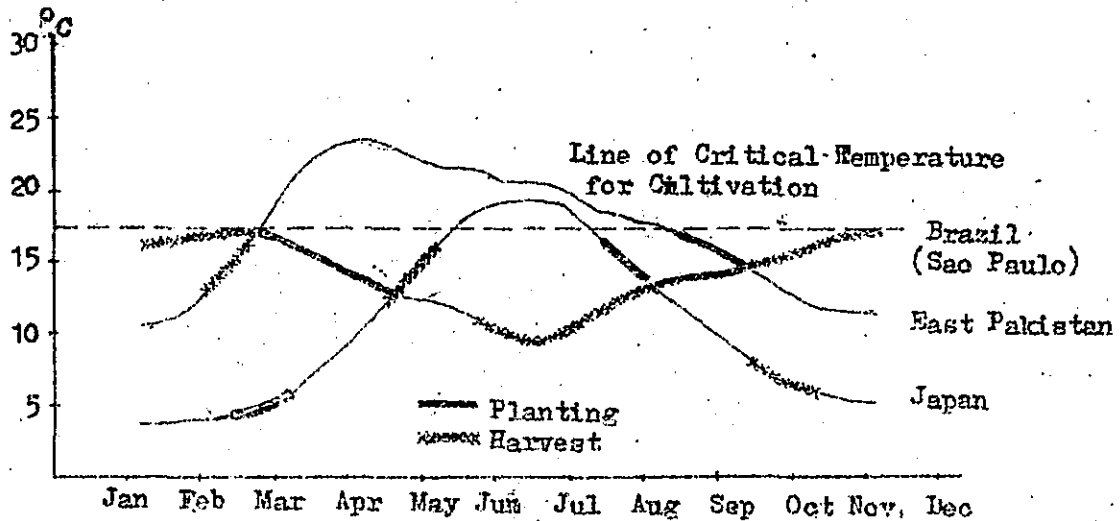
Source : The report of vegetable production in the Tropics JICA 1972.

Fig. 9.9. Pattern of Cultivation in Coll Highlands of the Tropical Zone



Source : Same as Fig. 9.8.

Fig. 9.10. Temperatures and Potato Cultivation Season



Source : Same as Fig. 9.8.

9.2. Estate crops (Industrial Crops).

9071. The establishment of the estate sub-sector in South Sulawesi Province has started since the onset of the compulsory cultivation movement in 1966 and it is continued during the period of Pelita. This compulsory cultivation movement is based on the fact that the monocultural agriculture pattern the economic development was apparently insignificant compared to other provinces applying the polycultural pattern. On the other hand, the South Sulawesi Province has quite a big productive potentiality of estate crops and it is technically feasible to conduct agricultural diversification.

9.2.1. Potential areas

9072. According to the potentiality, the climate, soil conditions and soil survey findings of the Institute of Soil Investigation in Bogor, South Sulawesi Province can be developed into center of development of estate crops farming such as the following commodities:

<u>Commodity</u>	<u>Kabupaten</u>
1. Coffee Arabica	Tator and Enrekang
3. C e a o	Majene, Mamuju and Polmas
4. T. bacco Virginia	Maros, Gowa, and Takalar.
5. T. bacco (Local)	Soppeng, Wajo, and Bone.
6. O l o v e	Luwu, Tator, Sinjai and Bulukumba.
7. N u t n e g	Selayar and Luwu.
9. P e p p e r	Sinjai, Bulukumba and Enrekang.
12. Coconut	Luwu, Bone, Wajo, Bulukumba, Selayar,
13. Oil Palm	Jeneponto, Majene, Polmas and Mamuju.
15. C o t t o n	Jeneponto, Takalar, Bantaeng and Bulukumba.
16. K a p o k	Bone, Wajo, Bulukumba, Jeneponto and Bantaeng
20. S e s a m u	Wajo and Takalar

9.2.2. Present land utilization for farming of estate crops.

9073. The farming of estate crops in South Sulawesi Province consists of the farming by the farmers and that by the enterprises, both Indonesia private and foreign ones.

1) Estate crops farming by the farmers.

9074. The farming of estate crops by the farmers in South Sulawesi Province has a greater role than the another ones. The development of estate crops farming by the farmers in South Sulawesi p rovince during 1969-1976 can be seen on tables 9.25,26 and 27.

9075. In the table different variation of each commodity will be seen e.g., for coconut, the acreage of planted area increase from 70,051 ha. in 1969 to 100,152 ha. in 1976, which means an increase of 43%, and production increase from 57,357 tons in 1969 to 67,863 tons in 1976 by percentage of 18%.

9076. As for coffee, the acreage increase from 21,219 ha. in 1969 to 25,481 ha. in 1976, which is an increase of 20%, while its production decreases from 6,429 tons in 1969 to 5,690 tons in 1976, i.e. 11%. Its average production has also decreased from 303 kg/ha. in 1969 to 223 Kg/ha. in 1976. It was mainly caused by the fact about half of the planted area include young tree area that yet can not yield and old tree area that is already fruitless. The composition of tree's age influence the yield of production in general. On table 9.26, it will be seen that among the 100,152 ha. of coconut planted area, only 65% can yield. 32% is young tree that can not yield yet and 3% is old one which do not yield any longers. Coffee has only 69% of producible trees area, 27% young trees area and 4% old ones area.

9077. Besides the high percentage of unproductive tree (the young and the old ones) area, there is another factor, i.e., the small acreage of estate crops possessed by each farmer. The situation can be seen in more detail on table 9.26 and 27.

9078. Having seen table 9.27, it is apparent that among the 13 commodities only one short achieves the average effort of each farmer up to more than 1 ha. (local tobacco 1,82 ha.). Three sorts of commodity, i.e. coconut, candlenut and kapok have an average of a little bit more than 0,5 ha. The rest them have an average of less than 0.5 ha., for pepper and sugar cane it is even only 0,10 ha. and 0,09 ha. respectively.

9079. The restricted acreage of each commodity for each farmer influences his income. The average income level of each household (farmer) on each commodity can be seen on table 9.27. It is to be seen that the farmers income level is not only determined by the acreage of planted area but also the unit price level of each commodity. For coffee, the

Table 9. Acreeage of planted area, production and yield of estate crops by the farmers in South Sulawesi Province (1969)

No.	Commodity	Planted area <sup>1)</sup> (ha.)	Production (tons)	Yield <sup>2)</sup> Kg./ha.
01/02.	Coffee	21,219	6,429	303
03.	Cacao	-	-	-
04.	Tabacco (Virginia)	-	-	-
05.	Tabacco (local)	-	-	-
06.	Clove	286	23	1
07.	Nutmeg	179	425	24
08.	Citronella grass	-	-	-
09.	Pepper	342	46	135
10.	Castor oil plant	-	-	-
11.	Candle-nut tree	22,750	4,739	208
12.	Coconut	70,051	57,357	819
15.	Cotton	-	-	-
16.	Kapok	17,741	1,719	0.97
17.	Roselle	-	-	-
18.	Sugar cane	571	9,492	16,623
20.	Sesame	-	-	-

Note: 1) Total acreage of planted area in ha., including (a) Planted area of young trees which can not yield, (b) Planted area of old trees which is fruitless already and (c) planted area yields products.

$$2) \text{ Yield Kg./ha.} = \frac{\text{Production}}{\text{Acreage of planted area.}}$$

Source: Dinas Perkebunan Sulsel.

Table 9. Area of planted area of estate crops by the farmers in South Sulawesi Province (1976)

Unit: ha. & (%)

No.	Commodity	Total	Producible	Unproductive area	
		Planted area (1)	area (2)	Young tree area (3)	Old tree area (4)
01/02.	Coffee	25,481(100)	17,427(69)	7,005(27)	1,049(4)
03.	Cacao	183	-	-	-
04.	Tabacco Virginis	1,332	-	-	-
05.	Tabacco Local	13,671	-	-	-
06.	Clove	8,454(100)	152(2)	8,297(98)	5(-)
07.	Nutmeg	877(100)	16(1.5)	857(98)	4(0.5)
08.	Citronella grass	-	-	-	-
09.	Pepper	758(100)	286(38)	442(58)	31(4)
10.	Castor oil	275	-	-	-
11.	Candle-nut	27,295(100)	19,342(71)	6,869(25)	1,084(4)
12.	Coconut	100,152(100)	65,049(65)	31,948(32)	3,155(3)
15.	Cotton	892	-	-	-
16.	Kapok	25,304(100)	9,419(37)	13,165(52)	2,720(11)
17.	Roselle	586	-	-	-
18.	Sugar cane	551	-	-	-
20.	Sesame	368	-	-	-

Note: (1) = (2) + (3) + (4).

Source: Dinas Perkebunan Sulsel.

Table 9.27. Production, yield and number of household of estate crops by the farmers and average gross income per household by production of estate crops in South Sulawesi Province (1976)

No. & Commodity	Production (tons) (5)	Yield (average) (Kg/ha) (6)	Number of household (7)	Average acreage (ha.) (8)	Unit Price (Rp/Kg) (9)	Average gross income (Rp) (10)
01.) COF	5,690	223	75,068	0.34	700	53,074
02. CAC	10	555	-	-	425	36,014
03. CAC	10	555	-	-	-	-
04. TOB/V	1,100	950	4,323	0.31	-	-
05. TOB/L	3,623	338	7,530	1.82	132	81,251
06. CLO	30	4	22,661	0.38	3,750	5,700
07. NUT	12	13	3,410	0.26	708	2,393
08. CIT	-	-	-	-	-	-
09. PEP	129	170	7,562	0.10	650	11,050
<b>10. CAS</b>	<b>82</b>	<b>298</b>	<b>914</b>	<b>0.30</b>	-	-
11. CAC	10,129	352	45,231	0.60	267	56,390
12. COC	67,862	678	162,325	0.62	95	39,934
15. COT	217	243	4,668	0.19	175	8,080
16. KAP	2,176	86	40,462	0.63	310	16,796
17. ROS	418	713	1,864	0.31	-	-
18. SUG	1,384	2,512	1,608	0.09	-	-
20. SES	111	302	415	0.89	171	45,961

Note: (6) yield Kg./ha. = Production (tons) (5) ÷ Total acreage (column 1. in the table 9.25.)

(8) Average acreage per household = Total acreage (column 1 in table 9.17.) ÷ (7).

(10) Average gross income per household = (6) × (7) × (9).

Source: Dinas Perkebunan Sulasel.

average acreage for each household is only 0.34 ha., it can give a higher income level, besides the commodities local and candlenut. It also shows in the development of commodities, besides the technical factor, the economic factor has to be considered, too, which is not less significant, especially in the prospect of each commodity's marketing.

2) Large scale farming of estate crops.

9080. Large scale farming of estate crops in South Sulawesi Province have quite a high potential, although they are as yet not entirely cultivated. 93 estates<sup>1)</sup> with a total acreage of 118,261 ha., are recorded in South Sulawesi Province, but only 9,627 ha. or 8% has been cultivated, such as seen on table 9.28.

9081. It will be seen that among the 90 private estates of 109,152 ha., only 7% is cultivated, while of the foreign estate only 25% is cultivated; and the 2,000 ha. joint venture estate are on trial cultivation. The distribution of those estates in 16 Kabupaten-s will be seen on table 9.29. According to table 9.29, the highest potential estate in South Sulawesi Province is found in Kabupaten Luwu, with 39 estates at an acreage of 40,753 ha. and only 5% of them is cultivated, and in Kabupaten Mamuju, where only 2% is cultivated among 5 estates at an acreage of 21,431 ha. On the cultivated land which is 9,627 ha. of acreage, various crops are planted such as rubber, coconut, clove, candlenut, coffee etc. The acreage of planted area with each commodity will be seen on table 9.30.

9082 No complete data is found yet about the condition, about the composition of crops age and the production, but it is estimated that it would not be much different from that of the farming by the farmers for each commodity. There is a notable difference between the farming by the farmers and farming of the estates. In farming by the farmers the acreage of each farm household, including four family members of his, is only 0.54 ha., which is a very small amount, compared to the minimal acreage which has to be possessed by each farmer household, i.e. 2 ha., to afford a decent living for a family consisting of 5 people. On the contrary in estates, they are only able to cultivate 8% of the land in their possession while the rest (92%) is not cultivated yet.

9083 The main commodities of estate crops in South Sulawesi Province are coconut and coffee. The coconut trees are spread

1) Estate means large farm by the large scale farming of estate crops, not by the farmers.



throughout the Kabupaten-s in South Sulawesi Province, and in many Kabupaten-s such as Polmas, Majene, Mamuju and Salayar they are even still monocultural crops which are the main source of income for the local community. The second main commodity is coffee. The coffee producing Kabupaten-s are Luwu, Marakang, Tator, Polmas, Sinjai, Bulukumba and Bantaeng. These two commodities have been cultivated since decades ago and it showed a decreasing productivity recently.

Table 9.28. Number of estate and acreage in South Sulawesi Province (1977).-

States	Number	Total acreage	Cultivated area	Unit : ha
				uncultivated area
National management	90	109,152 (100%)	7,849 (7%)	101,303 (93%)
Foreign managemo	1	7,109 (100%)	1,778 (2%)	5,331 (75%)
Joint venture	2	2,000 (100%)	-	2,000 (100%)
T o t a l :	93	118,261 (100%)	9,627 (8%)	108,634 (92%)

Table 9.29. Distribution of estate by Kabupaten in South Sulawesi Province (1977).-

Kabupaten	Number of estate	Total acreage	Cultivated area	Uncultivated area
01. Luwu	39	40,753	1,920 (5)	38,833 (95)
02. Tator	5	2,365	219 (9)	2,146 (91)
03. Soppeng	1	202	100 (50)	102 (50)
04. Wajo	7	1,541	207 (13)	1,334 (87)
05. Bone	4	14,404	1,510 (10)	12,894 (90)
07. Bulukumba	5	8,115	2,007 (25)	6,108 (75)
10. Jeneponto	1	250	-	250 (100)
11. Takalar	3	641	109 (17)	532 (83)
12. Gowa	3	16,050	1,450 (9)	14,600 (91)
14. Maros	4	1,191	144 (12)	1,047 (88)
16. Barru	1	2,000	500 (25)	1,500 (75)
18. Sidrap	7	7,384	435 (6)	6,949 (94)
19. Enrekang	2	225	76 (34)	149 (66)
20. Pinrang	2	549	157 (29)	192 (71)
21. Polmas	4	1,261	377 (30)	884 (70)
23. Mamuju	5	21,431	416 (2)	21,015 (98)
T o t a l :	93	118,261	9,267 (8)	108,634 (92)

Source : Dinas Perkebunan Propinsi Sulsel.

Table 9.30. Acreage of planted area by commodity in South Sulawesi Province. (1977).

No.	Commodity	Acreage (ha.)
01.)	Coffee	895
02.)		
03.	Cacao	28
06.	Clove	915
07.	Nutmeg	520
08.	Citronella grass	44
10.	Castor oil plant	100
11.	Candlenut tree	1,012
12.	Coconut	3,040
14.	Rubber	1,913
16.	Pepper	83
17.	Rosella	200
18.	Sugar cane	450
-	Others	229
T o t a l :		9,627

Source : Dinas Perkebunan Sulsel.

9.2.3. Productive elements.

9084. The estate sub-sector of the farming industry is handled by the farmers in small scale, with the average of 0.54 ha., employing quite traditional techniques of farming. Thus the management of estate crops farming by the farmers is generally undertaken by the owner himself. They only use laborer on harvesting, which they cannot do themselves. The cost of packing coconut fruits is, for example, 5% - 10% of the whole cost. In addition, the deficient farming techniques make the production rate low. The deficient use of fertilizers and pesticides is one of the indications that they are employing inadequate agricultural techniques.

9085. The table 9.31 and 9.32, will describe a very low amount of the use of fertilizers and pesticides compared to the real need for the two main commodities. From table 9.31, it is seen that the requirement fertilizers for coconut cultivation in 1976 is 30,045 tons. The amount used was only 1,500 tons. The requirement of pesticides for coffee during the same period was 28,304 tons while the amount used was only 1,800 tons.

9086. Table 9.32, shows that in 1976 the requirement of pesticides for coconut is 901,368 tons, and the amount being used is only 8,100 tons (0,8%). The requirement of pesticides for coffee is 159,849 tons, the amount used is only 1,045 tons (0,63%).

Table 9.31. Amount of fertilizer requirement and used for cultivation of coconut and coffee in South Sulawesi Province (1974-1978)

Year	Planted (ha.)	Requirement (ton)	Used (ton)
<u>For Coconut:</u>			
1974	92,058	27,617	1,000
1975	97,479	29,241	1,000
1976	100,152	30,045	1,500
1977	104,000	31,200	-
1978	106,000	31,800	-
Total		149,903	3,500
<u>For Coffee :</u>			
1974	24,652	19,721	3,000
1975	25,276	20,221	1,650
1976	25,481	20,381	1,800
1977	27,433	21,946	-
1978	28,221	22,577	-
Total		104,850	6,450

Source : Dinas Perkebunan Sulsel.

Table 9.32. Amount of pesticide requirement and used for cultivation of coconut and coffee in South Sulawesi Province (1974-1978)

Year	Planted area (ha.)	Requirement (tons)	U s o d (tons)
<u>For coconut:</u>			
1974	92,058	828,522	4,880
1975	07,479	877,230	6,300
1976	100,152	901,368	8,100
1977	104,000	936,000	-
1978	106,000	954,000	-
T o t a l	-	-	19,250
<u>For coffee:</u>			
1974	24,652	151,658	0,764
1975	25,276	155,810	0,230
1976	25,481	159,849	1,045
1977	27,433	164,590	-
1978	28,221	169,325	-
T o t a l	-	-	2,166

Source : Dinas Perkebunan Sulsel.

9.2.4. Income distribution, farm price and marketing cost.

9087. The farmers of estate crops farming in South Sulawesi Province are farm-owners, so that cost spent on outside laborers is only a picking cost of 5-10%. One of the factors which also trains the real income of farmers is the high marketing costs, especially transportation costs. This is chiefly because the estate crops farming in South Sulawesi are scattered in distribution, while the roads are in bad condition.

9088. For instance we take the marketing cost of crops in Kabupaten Polmas and Selayar, which is 47% and 48%. The average marketing cost of copra in South Sulawesi is 45%. The price of the farmers as producers and the market price in Ujung Pandang as accumulation center are quite different and the farmers price is very low (see table 9.33).

Table 9 33 Average prices of coconut, copra and coffee by type of price in South Sulawesi Province (1969-1976).

		Unit: Rp/Kg.							
Commodity/ Types of Price	1969	1970	1971	1972	1973	1974	1975	1976	
<u>01. Coffee/Arabica</u>									
Farmers	248.5	290.0	285.0	267.5	283.5	308.0	345.0	700.0	
Kabupaten's	325.0	400.0	350.0	350.0	375.0	425.0	510.0	800.0	
U. Pandang's	390.0	455.0	450.0	420.0	445.0	485.0	540.0	1010.0	
<u>02. Coffee/Robusta</u>									
Farmers	135.0	175.0	200.0	195.0	190.0	230.0	255.0	475.0	
Kabupaten's	195.0	250.0	275.0	280.0	280.0	300.0	295.0	650.0	
U. Pandang's	215.0	280.0	310.0	300.0	300.0	360.0	310.0	700.0	
<u>12. Coconut</u>									
Farmers	6.5	8.5	10.5	14.0	18.5	26.0	18.5	28.5	
Kabupaten	10.0	11.5	20.0	25.0	25.0	42.5	27.5	40.5	
U. Pandang's	12.5	16.5	22.5	35.0	35.0	50.0	35.0	55.0	
<u>21. Copra</u>									
Farmers	25.0	32.5	45.0	50.0	70.0	36.5	64.5	95.0	
Kabupaten's	35.0	47.5	55.0	57.5	80.5	120.0	69.5	110.0	
U. Pandang's	45.5	55.0	70.0	90.0	135.0	166.5	35.5	175.0	

9.2.5. Marketing

9089. Besides to fulfill needs of local consumers, estate products are also to be shipped for inter-insular trade and export and to be used as main materials for industrial purpose. The supplying regions are scattered throughout the area, while the consumers demanding the products are located in the cities, so that transportation has a significant role.

9090. Consumptive level of fresh coconut per capita of South Sulawesi farmers is 22.08, converted into approximately 5 kg. of copra. (Seminar on coconut estates in South Sulawesi, 1976). For the consumption of 5,654,802 people in South Sulawesi Province, 28,274 tons of estate crops products are needed. Comparing with production of coconut in 1976 which has 67,862 tons of copra, South Sulawesi has a market table for oil refining. Following list will show the amount volume of interinsular trade of copra, during 1969-1976.

Table : Amount volume of copra by interinsular trade  
9.34. of South Sulawesi Province (1969-1976).

<u>Year</u>	<u>Volume</u>
1969	2,558,874 Rupiah-s
1970	13,374,005 -"-
1971	12,662,988 -"-
1972	16,193,991 -"-
1973	8,142,151 -"-
1974	8,211,422 -"-
1975	14.967.815 -"-
1976	11.148,590 -"-

9091. Coffee, which is the second main commodity for local consumption, according to the survey findings of the SAE in 1974, has an average amount of 2,31 kg. for the supplying regions, and for consuming regions 1.23 kg per capita each year. For coffee export in 1978, South Sulawesi gets a supply of 2,310 tons.

9.2.6. Extension and other services

9092. There is a lack of facilities for the development and maintenance of estates in South Sulawesi Province, concerning both the physical and fiscal. There are only 6 extension services placed in the blocs, which will extend service to the community, so that each unit covers 2 to 5 Kabupaten-s; those are as follows:

<u>Location</u>	<u>The territory</u>
a) Palopo	Luwu and Tator
b) Bone	Bone, Soppeng and Wajo
c) Bulukumba	Bulukumba, Bantaeng, Sinjai and Selayar.
d) U. Pandang	Ujung Pandang, Pangkep, Maros, Gowa, Takalar and Jenepono.
e) Pinrang	Pinrang, Birekang, Barru, Sidrap and Pare-Pare.
f) Majene	Majene, Mamuju and Polmas.

9093. In some Kabupaten-s an estate crop farming center has been established in each Kabupaten which will function as a experimental station and as a seed center for the farmers, but it does not function properly yet, especially concerning the seeds. The location of the centers in South Sulawesi is shown on table 9.35.

9094. Two kinds of main commodities in South Sulawesi Province have decreased in their productivity due to old age. It is estimated that more than 50% of coconut trees in South Sulawesi Province are more than 50 years of age. Coffee also there are many old, unproductive trees. For these two commodities, the special countermeasures has been operated such as the establishment of a kind of experimental station unit. For coconut, 17 units have been established, each unit including a farm is an acreage of 3,000 ha. Replanting is done gradually on 300 ha. of coconut trees each year, that is 10% by units.

9095. Table 9.36 shows the location of Project Management Unit-Coconut Working Centres (P.M.U.C.W.C.) in South Sulawesi Province.

The replanting coffee trees, 3 units have established, i.e. the Management Unit Renewal Project. Each unit covers 500 ha. An acreage of 100 ha. are renewed each year, i.e. 10%.

The location of each unit is as follows:

<u>Unit</u>	<u>Kecamatan</u>	<u>Kabupaten</u>
1.	Rinding Allo	Tator
2.	Topobulu	Bantaeng
3.	A l l a	Birekang

Table 9.35 Seed gardens of Industrial Crops Extension Service

No.	Name of the estate crop farming center	Acreage of farm (ha)	Location/ Kabupaten	Commodity
1.	Bone-bone	20.00	L u w u	coconut
2.	Sariti	5.00	L u w u	pepper
3.	Duntuasa	3.50	Tator	clove
4.	Tampangeng	1.00	W a j o	sugar cane
5.	Batu Karopa	14.00	Bulukumba	clove, nutmeg, coffee, coconut.
6.	Bikeru	1.90	Sinjai	nutmeg, pepper, coconut, coffee, clove, cacao, oil palm.
7.	Birue	1.00	Barru	clove
8.	Salubarani	5.72	Enrekang	clove
9.	Tiktok	5.00	Enrekang	coffee (Arabica)
10.	R e a	6.00	Polmas	coconut (local), clove, cacao
11.	Paceda	5.00	Polmas	coconut (local, Mapanget)
12.	Bangkala	1.00	Jeneponto	cacao
13.	S i w a	1.00	W a j o	
14.	Larompong	1.00	L u w u	

Table 9.36 P.M.U.C.W.C. in South Sulawesi Province

No.	Location of units/Kecamatan	Kabupaten	Established year
1.	Bupon/Bojo	L u w u	1975
2.	Larompong	L u w u	1976
3.	Herlang	Bulukumba	1975
4.	Kajang-	Bulukumba	1976
5.	Ujung Bulu	Bulukumba	1976
6.	Bontotene	Selayar	1975
7.	Bontoharu	Selayar	1975
8.	Tinambung	Polmas	1975
9.	Campalagian	Polmas	1975
10.	Polewali	Polmas	1976
11.	Banggae/Pamboang	Majene	1975
12.	Malunda	Majene	1976
13.	Tellusiatinge	Bono	1976
14.	Pammana	Wajo	1976
15.	Binamo	Jeneponto	1976
16.	Sawitto	Pinrang	1976
17.	Tappalang	Mamuju	1976



9096. Besides the endeavor to replanting of coffee, another unit has been established, i.e. the Project Management Unit Coffee Processing Centre (P.M.U.C.P.C.) in Kabupaten Tator to improve the quality of coffee in South Sulawesi Province.

9.2.7. Conclusion and suggestion

1) Conclusion

9097. a) The extremely limited acreage of estate crops farm by the farmers (0.54 ha) for each commodity, while in the estates, 108.634 ha of land is recorded to be uncultivated.

9098. b) The average income of the farmer from each commodity is very low, because in addition to the very small acreage, the average production per ha. is very low, due to many unproductive trees and also due to insufficient maintenance. The farmers level price out of the market price is very low due to the weak position of the farmers.

9099. c) Two main commodities in South Sulawesi Province i.e. coconut and coffee, have had a decrease in their productivity due to many old trees which are fruitless. Some efforts have been undertaken to handle the situation, i.e. by establishing the P.M.U.C.W.C. for the renewal of coconut and coffee trees.

2) Suggestion

9100. a) The acreage of estates which thus far has not been cultivated by the owner has been handed over to some one who are able to cultivate it, whether they are farmers or resettler (e.g. in Mamuju). That of estate crop farming by the farmers is aimed at the intensive management (the use of fertilizers and pesticides). The intensive way of improvement will rapidly improve the production of renewal. Besides the expansion of young trees, the renewal is conducted on old trees which do not produce any longer. On productive crops, intensive maintenance is established.

9101 b) To overcome the weak position of the farmers in the marketing of their crops, the BUUD/KUD ought to be improved including their capital/credit availability, so that they are able to tackle not only food stuffs or rice, but also other commodities.

9102. c) To renew estate commodities, especially longtime ones, selected seeds are used. For the development of each commodity, their marketing programs have to be taken care of.

9.3. Animal Husbandry

9.3.1. General activities for developing animal husbandry

9103. During the first Pelita (1969/1970 - 1973/1974) until the third year of of Pelita II, the entire aims of the general activities of developing animal husbandry done by The Animal Husbandry Office of South Sulawesi Province are as follow:
- a) Increasing of food production especially animal protein in connection with the improvement/increasing of the nutrition volume of the people.
  - b) Increasing of income of farmer by improving the technology, concerning producing and marketing of livestock and livestock production.
  - c) Extending of employment possibility/opportunity by animal husbandry farming especially on the field of beef cattle (ranch and small holders), beside poultry-farming (commercial and back-yard).
  - d) Increasing of National devisa by increasing of the export volume of Livestock and livestock product.
  - e) To maintain the natural equilibrium by improving the soil structure through regreening effort by using of animal-food crop (pasture grass, pasture legums) as a commodity.

9104. The projects of the sub sector of animal husbandry that has been operated for improvement and development of animal husbandry during Pelita I and Pelita II of South Sulawesi covers:

- a) Increasing of animal husbandry production.
- b) Increasing of animal disease prevention.
- c) Extension.
- d) Beef - cattle - breeding.
- e) Poultry - farming.
- f) Dairy - farming.
- g) Management/Supervision of the project.

9105. Beside the development and improvement activities of livestock that has been directly handled by The Animal Husbandry Office of South Sulawesi Province which expencies were provided by the budget either from the central Government or Regional, also there is to be found development activities of livestock supported by International agencies like:

- a) Disease Investigation Centre in Maros, supported by the budget of FAO and UNDP.
- b) P.T. Bina Kulya Ternak, a ranch of Beef-cattle, located in Enrekang, Sidrap and Wajo, which was supported by the World Bank.

The figures of the livestock population in South Sulawesi Province that shows the export, interinsular, slaughtering and also particularir/specific of their development can be seen on the enclosure tables.

9106. The main activities of the development of livestock in South Sulawesi Province can be divided in several effort such as follow:

- a) To Combat the infectious diseases
- b) Improving of the quality of livestock through breeding
- c) Improving of the quality and quantity of the livestock food-stuff.

9.3.2. Improverment of Livestock.

- 1) To Combat the infectious disease.

9107. The effort to combat the infectious diseases of livestock was the first main activity on the effort to develop the quality and quantity of livestock. These activities was in the form of preventing the extend of diseases also treatment and safe-guarding of the livestock which was infected. During the last 5 years there was a suffering of Intectious diseases, deadness of livestock, curement and treatment beside activities to prevent the extend of those diseases which could be shown on the table below:

Table 9.37. Disease situation in South Sulawesi 1972 - 1976.

Year	S E			Anthrax			Surra			N D		
	Case	Dead	Cure	Case	Dead	Cure	Case	Dead	Cure	Case	Dead	Cure
1972	1321	646	675	739	623	116	801	80	721	-	-	-
1973	2544	777	1767	440	419	21	1312	152	1160	2119	2119	-
1974	2016	592	1424	146	1	145	1276	640	636	57	-	57
1975	1685	148	1537	268	52	216	2641	1211	1430	636	411	225
1976	789	316	473	62	6	56	4761	1327	3434	14207	13900	307
Total	8355	2479	5876	1655	1101	554	10791	3410	7381	17019	16430	589

Source: Animal Husbandry Office of South Sulawesi Province, Annual Report 1972, 1973, 1974, 1975, 1976.

9108.

The Animal Husbandry Service on his activities to combat and controle these infectious diseases has carried out vaccination effort on all cattle aga- inst the diseases mentioned above and has cured thousands of infected cattles:

Table 9.38 Vaccination

Year	S E	Anthrax	Surra	A E	Rabies	N D
1972	235,808	88,209	724	-	856	538,751
1973	227,640	125,471	1,362	42,931	925	635,899
1974	218,386	101,230	1,078	87,683	1,200	531,474
1975/ 1976	418,987	152,258	11,140	59,363	4,288	1,584,656
1976/ 1977	507,644	143,040	8,138	-	8,737	1,863,856
Total	1,608,465	608,154	22,422	189,977	16,006	5,154,636

Source: Animal Husbandry Office of South Sulawesi Province, Annual Report.

9109.

However, there are following problems in the South Sulawesi today:

- a) The break out of new diseases, caused by imported carryer (imported cattle from Australia) such as Brucellosis, Pseude-Monas Sp and High Virulent Piroplasmosis.
- b) Problems of prevention and eradication of local diseases such as:
  - a. Vaccin, drugs and equipment are not continuesly in stock.
  - b. Shortage of technicians.
  - c. Hindrance on transportation of technisien, vaccin, equipment, and drugs to the wanted location.
- c) Lack of Extention effort on animal diseases prevention.
- d) Sending of materials of animal diseases to Disease Investigation Centre ( DIC ) is not regularily.
- e) The surveillance is less intensive which included:  
reporting, recording, analysing, and evaluation of animal diseases.

2) Rezoning of Beef-Cattle.

9110. The extend of Beef cattle in South Sulawesi Province is not equally distributed. There are some Kabupatens which has an areal of grass land which is too small but has a crowded beef cattle population, otherwise there are also Kabupatens that has a large one but the density of cattle population is very thin.

On the effort of beef cattle rezoning, the government has dislocated beef cattle from thick populated cattle area to other regions that has scarce one. 9111.

Those thick populated area like Kabupaten Barru and Kab. Bone, the cattles has suffered of degeneration caused through-inbreeding. To this case, There has been oneffort to renew the breed by using breeding bulls from others areas.

9112. Figures of the effort of cattle rezoning could be seen on table below.

Table 9.39 Beef-cattle Rezoning in South Sulawesi Province 1975/1976.

Kabupaten	Cess.	Spreda	R.K.T.	AFBD	APBN	Veefonds	Total
1. Enrekang	50	6	-	-	60	-	116
2. Bone	9	-	-	20	20	-	49
3. Maros	-	35	6	-	20	-	61
4. Wajo	10	-	-	-	14	-	24
5. Pinrang	-	-	-	-	10	-	10
6. Soppeng	-	45	21	-	5	-	71
7. Takalar	-	29	3	-	26	-	58
8. Polmas	26	-	-	-	50	362	438
9. Luwu	-	-	-	-	50	27	77
10. Bantaeng	-	-	-	-	50	-	50
11. Pangkep	-	-	-	-	50	-	50
12. Gowa	-	58	-	-	20	-	78
13. Tator	47	-	-	-	50	-	97
14. Mejene	47	-	-	-	28	31	106
15. Bulukumba	59	-	-	-	11	-	70
16. Sinjai	30	-	-	-	12	-	42
17. Mamuju	25	-	-	-	-	-	25
18. Barru	9	-	-	10	-	-	19
19. Jenepono	-	25	-	-	-	-	25
Total	312	198	30	30	476	420	1466

Source: Animal Husbandry Office of South Sulawesi Province, Animal Report 1975/1976.

3) Selection and Castration.

9113. Selection and Castration is an activity of breeding to improve the quality of livestock especially for cattle which shown the figures of repeatedly increasing in the term of population/quantity but in fact the quality shows a decreasing as a result of using inferior breed stock and also through in-breeding.

9114. In 1975/1976 for about 22,000 heads of cattle and water buffalow has been castrated and for 1976/1977 the amount is for about 20,000 heads.

9115. Beside the effort of the government to improve the quantity and quality of beef cattle, there are also private activities on sub sector of animal husbandry in the form of ranch in some Kabupatens, such as shown on the table below.

4) Panca Usaha Ternak Potong (PUTP)

9116. A. i. m

- The Aim of PUTP (Panca Usaha Ternak Potong)

- are: To increase the meat production
- To increase the farmer's income
- To increase the employment opportunity.

Execution

9117. PUTP is a system of credit, given to the farmer in the form of cattle-package.

In the budged year 1976/1977, the Director General of the Animal Husbandry Office has prepared for South Sulawesi Province 394 breeding stock package and 1800 fattening package.

The breeding stock package consist of 5 cows and additional cost of the value for about Rp. 410,000, the fattening package consist of 1 bull and additional cost of the value for about Rp. 80,000.

Table 9.40 Total and Realisation of PUPP in South Sulawesi  
Province Budget year 1976/1977.

Location	Total Package				Realisation			
	Breeding stock		Fattening		Breeding stock		Fattening	
	Package	Head	Package	Head	Package	Head	Package	Head
1. Barru	115	575	300	300	65	325	8	8
2. Pinrang	135	675	650	650	38	190	18	18
3. Sidrap	130	650	650	650	36	330	8	8
4. Pare-Pare	14	70	200	200	8	40	-	-

Source: Animal Husbandry Office of South Sulawesi Province,  
Annual Report 1976/1977.

5) Artificial Insemination.

9118. The aim of cattle breeding in South Sulawesi is to reach a life body weight to that of imported cattle about 1250 kg.

The breeding method to reach this aim is the implementation of cross-breeding by the artificial insemination. This method of breeding will be introduced in all Kabupatens of South Sulawesi, except the Kabupatens Bone, Barru and the northern area of Kabupaten Enrekang (Kecamatan Anggeraja, Kecamatan Alla and Kecamatan Baroko).

9119 According to the policy of The Animal Husbandry Office, the pure breed of Bali cattle will be held in 3 Kabupatens mentioned above.

The life body weight of about 1250 kg as the aim of this method of breeding will be reached at F4 within the period of 12 years plan.

9120. The Animal Husbandry Office of South Sulawesi has planned to use the breeds Hereford, Shorthorn, Limousine, Braclman, Charolais to above the cattle breeding by using the artificial insemination method.

- Location of Artificial insemination in South Sulawesi are:

Kabupaten Luwu, Kabupaten Sidrap, Kab. Pinrang, Kab. Polmas, Kab. Gowa, Kab. Bantaeng, Kab. Pangkep, Kab. Sinjai and Kab. Soppeng.

- In the budgeted year of 1977/1978 The Animal Husbandry Office is going to build up the Artificial Insemination Station in Bili-Bili Kabupaten Gowa.

- The total target of A.I. in South Sulawesi, for the budgeted year 1977/1978 is 15,000 heads.

Table 9.41 Location and target of Artificial Insemination in South Sulawesi '77/'78

No. Kabupaten	Location	Target	Remark
1. Luwu	Lamasi	2,000	
2. Polmas	Wonomulyo	2,500	
3. Sidrap	Sidrap	2,500	
4. Pinrang	Mattirodeceng	1,000	
5. Gowa	Tombolo	1,000	
6. Soppeng	Soppeng	1,000	
7. Bantaeng	Bantaeng	1,000	
8. Sinjai	Bikeru	1,000	
9. Pangkep	Mandalle	1,500	
	Mattapa	1,500	
T o t a l		15,000	

Source: Animal Husbandry Office of South Sulawesi, Interview with the Chief of the Insemination Station Ujung Pandang.

6) Poultry Farming

a) Poultry Bimas.

9121. The Bimas for chicken with the Credit System provided by the Bank (ERI) has been operated and the first time on the year 1976/1977 to mention as the stage of feasibility Study concerning the chicken in Ujung Pandang and the surrounding area, utilized by the Faculty of Economy, University of Indonesia and the Faculty of Economy of UNILAS. Beside that, to the survey, the Animal Husbandry Service of South Sulawesi Province and the Faculty of Agriculture was also involved.

9122. The operating of the Bimas chicken as mentioned above was planned for the Budget of 1977/1978 and located in Ujung Pandang and the surrounding area withing the radius of 30 Km, so to this, also Kab. Gowa, Maros and Pangkep area included but until now the realisation is not yet arranged.

b) Up-grading of the Native Chicken.

9123. During the budget year of 1976/1977 and 1977/1978. The Animal Husbandry Service of South Sulawesi Province, beside his effort to combat the N.C.D. disease also to increase the quality of the Native chicken by providing breed stock of the type which produce better meat and egg; in the form of cross-breeding with the native chicken.



9124. For the budget year of 1976/1977 for about 1,300 breed stock are spread-through whole South Sulawesi. This means that each Kabupaten has approximately of 50 heads and for the budget year of 1977/1978 there are 2,300 breed-stock in stock that means that each Kabupaten could have 100 heads of breed stock.

c) Poultry Farming.

9125. The poultry-farming of Imported Breedstock during the last 2 years of the recent budget was increased surprisingly, especially in Ujung Pandang and the surrounding area.

To urged the development of poultry farming, the government gives the support by giving an intensive extension and to smooth the facilities of import of breedstock to Ujung Pandang.

The import of D.O.C. to Ujung Pandang.

area: In 1975/1976 = 54,208 heads.

1976/1977 = 140,900 heads.

9126. The amount of poultry and the amount of chicken owned by those poultry-farming are to be seen on table below.

Table 9.42 Poultry Farm in South Sulawesi Province 1976 and 1977

Kabupaten	1976		1977		Total of poultry farm	Total Starter Grower Layer	Total Chickens	Total
	Total of poultry farm	Starter Grower Layer	Total of poultry farm	Starter Grower Layer				
Ujung Pandang	83	-	72	4,343	11,928	38,450	54,721	
Pare-Pare	-	-	2	100	120	174	394	
Soppeng	-	-	9	242	212	2,422	2,876	
Maros	-	-	5	125	225	913	1,263	
Pangkajene	-	-	38	1,809	1,179	4,740	7,728	
Takalar	-	-	5	-	-	374	374	
<b>Total</b>	<b>83</b>	<b>-</b>	<b>131</b>	<b>6,619</b>	<b>13,664</b>	<b>47,073</b>	<b>67,356</b>	

Source: Animal Husbandry Office of South Sulawesi Province.

9.3.3. Grass-land improvement in South Sulawesi Province.

9127. . . The method of approach of the grassland improvement is to study the livestock population and the need of pasture by head by day for all kinds of livestock that will be shown on the table below.

Table 9.43. Required pasture by head and by day.

No.	Commodity	Population 1975	Pasture need/ head/day kg.	Total pasture need/day kg.
1.	C o w	485,679	20	9,713,580
2.	Buffalo	375,097	30	11,252,910
3.	H o r s e	169,102	20	3,382,040
4.	G o a t	288,941	3	866,823
5.	S h e e p	9,669	3	29,007

25,244,360 kg.

or 25,244,360 ton

9128. The pasture needs of livestock in South Sulawesi Province within one year is  $365 \times 25,244 \text{ ton} = 9,214,060 \text{ tons}$ . This pasture will be produced by the available grassland in South Sulawesi.

9129. According to the progress report of PT. Bina Mulya Ternak 1973/1975 the carrying capacity of grassland in Maiwa and Sira which is measured to the need of imported cattle is: Local grass = 0.25 - 0.5 head/ha. and Improved-grass = 0.8 - 1.2 head/ha.

For local cattle the carrying capacity is:

Local-grass = 0.5 - 1 head/ha.

Improve-grass = 1.6 - 2.4 head/ha.

9130. Based on these carrying capacity of grassland and pasture needs of a cow, means that the grassland needs for livestock in South Sulawesi Province will be calculated as follow:

a). Average production capacity of non improved grassland in South Sulawesi = 7,300 kg.ha/year.

b) Total pasture needs for livestock = 9,214,060 ton in South Sulawesi Province for 1 year.

Therefore the grassland needs for livestock in South Sulawesi Province:

a) Non improved grassland =  $\frac{9,214,060}{7.3} = 1,262,200 \text{ ha.}$

b) Improved-grassland =  $\frac{9,214,060}{17.52} = 525,916 \text{ ha.}$

The available grassland in South Sulawesi covered 590,000 ha, which means less than the calculated non improved-grassland as mentioned above.

9131. This was caused by the method of cattle breeding in South Sulawesi. Cattle and buffalows live and grab where the owners live. So they live and grass in the village, on the sawah area, on grassland, on afforestation area and reforestation area. Consequently, they are going to damage the reforestation and afforestation area.

9132. The way to avoid this problem is to increase the grass production by improving the available grassland with superior pasture grass, pasture legumes and cutting grass.

9133. The carrying capacity of the improved grassland is 2,4/1 ha (local cattle, according to the experience of BMT). This means the grassland that should be improved in South Sulawesi Province covered an area of 590,000 ha, and will have a carrying capacity of  $5,900,000 \times 2.4$  heads = 1,416,000 heads.

9133. During the last 3 years, the Animal Husbandry Office of South Sulawesi Province has introduced grass seedling gardens in all Kabupaten to improve the available grassland. This grass seedling gardens will be planted with superior pasture grass, pasture legumes and cutting grass and will fulfill a duty as local grass improving centre (Refer to table 9.45.).

Table 9.44 Carrying capacity of Grassland in South Sulawesi Province.

Imported Cow

Present Grassland	0.25	0.5 head/ha.
Improved Grassland	0.8	1.2 head/ha.

Local Cow

Present Grassland	0.5	1 head/ha.
Improved Grassland	1.6	2.4 head/ha.

Source: P.T. Bina Mulya Ternak

Progress Report 1973 - 1975.



12. Enrekang	a. Maiwa	2	Style Santhos SP
	b. Enrekang	2	Style Santhos SP
	c. Anggeraja	5	Pennisetum Purpureum Style Santhos SP
13. T a t o r	a. Mangkendek	1,5	
	b. Rantepao	0,1	
	c. Makale	0,75	
14. Polmas			
15. Mamuju	Siambung	-	Pennisetum Purpureum Sorghum SP.
16. Majene	a. Segeri	3,5	Pennisetum Purpureum Siratro SP
	b. Pacoda	4	Phaseolus SP Sorghum SP Brachiaria Erizantha Brachiaria Decumbens Paspalum SP Digitaria Decumbens Colopogonium maconoides Style Santhos SP Flamingia Congesta Clycina Cooper Sesbania randiflora.
17. Pare-Pare	K.M. 7	1,5	Style Santhos SP Centrosema SP Siratro SP Brachiaria Erizantha Pennisetum Purpureum Desmodium SP
18. B a r r u	Awarange	4	Style Santhes SP Pennisetum Pupureum
19. L u w u	Palopo	7	
20. Pinrang	-		
21. Selayar	a. Benteng	0,5	Setaria SP
	b. Jampea	0,25	Brachiaria Erizantha
		146.6 Ha.	

Source: Annual Husbandry Office of South Sulawesi Province  
Annual Report 1975/1976.

Table 9.46 Table of livestock population in South Sulawesi  
Province 1969 - 1976/1977

Year	Horse	Cow	Buffalow	Goat	Sheep	Pig	Poultry	duck
1969	137	236	329	192	2	156	4,334	316
1970	139	248	340	191	2	151	7,463	316
1971	146	293	340	201	4	156	7,071	316
1972	146	323	349	201	4	156	6,754	316
1973	158	403	355	207	5	233	4,753	372
1974	155	431	361	233	7	244	6,229	526
1975	167	485	375	288	9	344	9,739	947
1976/1977	171	539	383	486	11	364	12,629	3,482

Source: Animal Husbandry Office in South Sulawesi Province, Annual Report.

9.3.4. Development of feeding the cattle and poultry

9135. 1) The kinds of cattle run by people in South Sulawesi Province are horses, cows, buffalow, goats, sheep, pigs, and chicken/ducks. In the year 1976/1977 there are:

1) horses	171,112
2) cows	539,686
3) buffalows	383,199
4) goats	486,052
5) sheep	11,388
6) pigs	364,641
7) chicken	12,629,945
8) ducks	3,482,529

(Refer to table 9.46)

9136. 2) The rate of growth of cattle year by year during the period of 1969 - 1975 has risen by 12.22%. The increase of cattle included herein are classified as follows: horses 3.56%, cows 15.17%, buffalows 2.49%, sheep 25.77%, goats 9.18% and pigs 17.16%. When it is connected with annual rate increase, which is percentage of new born and imported cattle subtracted by the dead, the slaughtered and exported ones each year, it turns out that the annual rate average of increase during the period of 1969-1976 for large cattle is 5.68% and small cattle 13.32%. This data originated in detail from the annual rate of increase of large cattle: horses 3.69%, cows 10.91%, buffalows 2.44% and that of small cattle: goats 7.66%, sheep 21.07% and pigs 11.23%.

9137. The feeding of cattle is divided into 3 classification: large cattle, small cattle, and poultry. During the Pelita the feeding of cattle has risen from year to year for the large cattle; the small cattle as well as poultry. The feeding of large cattle has increased from 703,165 in 1969 to 1,093,997 in 1976, which means an increase of 390,832 or 55.58% (average of 8%).

9138. The feeding of small cattle has increased from 4,334,545 in 1969 to 12,629,945 in 1976, which means an increase of about 8,295,400 or 191.38% (annual rate 27.34%).

The attempts to improve the quality of the breed are only aimed at cow/beef for the group of large cattle, and chickens for the poultry.



9139. The amount of cattle and poultry have been introduced during the Pelita II is as follows:

cows from abroad	3,799
frozen sperm from abroad	6,000 ampouls
chicken D.O.C.	135,389

9140. alabio ducks 1,200

Small cattle such as goats, sheep and pigs have not received attention.

The cows introduced from abroad in South Sulawesi during the Pelita II by:

P.T. Bina Mulya Ternak	3,035
P.T. United Livestock	750
President's Aid	14

In the form of frozen sperm

6,000 ampouls

9141. The development of private feeding corporations, in the form of small, medium size and big ranches as well as in intensive poultry farms in them Pelita II gives us a good hope for the future, yet at present time most part of the development is still unsatisfactory, due to some factors e.g.:

- very restricted finance and credit procedures which are quite complicated to be fulfilled by the entrepreneurs.
- tax system which put a strain to the businessmen because they are already charged before they start production.
- the license of land use is also one of the requirements which is quite hard for the businessmen.

There are 40 ranches which are separated in South Sulawesi and which are always expecting support in guidance and management.

9142. Attempts of the government in increasing husbandry products are e.g.:

- the protection of cattle against infectious animal diseases.
- the upgrading of cattle quality by importing high quality cattle breed, both in the form of livestock and frozen sperms in the activity of artificial insemination
- the realization of the PUTP.
- the realization of the poultry Bimas.

9143. The response of the community towards the PUTP project is quite good as there is plenty of demands from the Kabupatenens which want to be PUTP locations.

9.3.5. Demand and supply of the husbandry products

9144. 1) The channel of distribution in the marketing of livestock

follows the line: producer - middlemen - export or interinsular tradesmen/  
butcher - consumer. The livestock marketing centres in South Sulawesi are  
Ujung Pandang municipal for local consumption (slaughter houses) and  
Pare-Pare municipal for interinsular and export trade.

In addition to that, the harbours of Palopo, Bajoe, Ujung Pandang, AwarangE  
and Majene act as ports for interinsular shipment of livestock to other  
provinces e.g. Java, Kalimantan, Central Sulawesi, Southeast Sulawesi  
and Irian Jaya. For a clear description shows in appendix 5.

9145. 2) The products of the husbandry sector in 1976, which also consti-  
tute the supply of livestock products for the community needs as consumpti-  
on and commercial commodities,

The source of the livestock supply is the rate of birth, the rate of in -  
coming livestock through interinsular shipments and imports subtracted  
by the death rate, while demand is the total of domestic consumption plus  
the number of livestock sent out through interinsular trade and export.

During the year 1976 a supply of livestock has been obtained, i.e. 85,606  
cows, 43,332 buffaloes, 8559 horses, 61,272 goats, 3,191 sheep and  
10,904 pigs. Out of the above mentioned numbers, the community has consu-  
med of 22,646 cows, 951 horses, 2,186 goat, 135 sheep and 20,768 pigs. The  
number of livestock shipped out in interinsular trade is respectively  
21,300 cows, 6,250 buffaloes, 146 horses, 1,960 goats and 136 pigs;  
exported: 1,750 cows and 920 buffaloes.

9146 3) We can see the development of poultry farming, specially race  
chicken during the Pelita II by the amount of D.O.C. imported to South  
Sulawesi, from year to year that is:

19,605 in 1974  
43,691 in 1975 and  
93,093 in 1976

With the estimation of production in 1974 to be 252 tons (about  
5,040,000 eggs), in 1975, 375 tons ( $\pm$  7,500,000 eggs), in 1976,  
815 tons ( $\pm$  16,320,000 eggs).

Other attempts implemented in relation to the development of poultry in  
South Sulawesi within three years of Pelita II are

preparation.....

preparation of realization of poultry Bimas, which is a feasibility study of projective areas of poultry Bimas in the town of Ujung Pandang and its surroundings within 31 km radius. This survey was established by the Institute of Economy and community of the Faculty of Economics, Un.Indonesian in cooperation with the Institute of Management of the UNHAS. The results of this survey show that Ujung Pandang and its surrounding are feasible enough, technically as well as economically to be poultry Bimas areas.

Besides that, the survey has also found a performance of poultry farming in Ujung Pandang and surroundings which is as follows:

egg production potential, average	68.70%
mortality of D.O.C. 0-6weeks old	23.89%
"    " grower 6-24 weeks old	7.16%
"    " layer .....	1.93%

9147. 4) Estimation of meat availability in 1976 and 1981.

According to the estimation of meat consumption in 1976 and the estimation of livestock population and meat consumption in 1981, as is shown on table V.11, the meat consumption in the Province of South Sulawesi in 1976 is

$\frac{13,325,367}{5,654,802} = 2.36$  kg per capita each year. So the lack of meat for the South Sulawesi residents viewed from the national standard is  $8.1 \text{ kg} - 2.36 \text{ kg} = 5.74 \text{ kg}$ .

According to the present livestock potential and the estimation of community potential to develop husbandry in the future, the potential meat consumption for 1981 is estimated to be  $\frac{18,241,052}{6,186,054} = 2.95$  kg percapita each year.

Viewed from the national standard of meat requirement, the South Sulawesi Province still lacks  $8.1 \text{ kg} - 2.95 \text{ kg} = 5.15 \text{ kg}$ .

Thus during the following 5 years period, an increase of meat consumption of  $2.95 \text{ kg} - 2.36 \text{ kg} = 0.59 \text{ kg}$  is obtained.

The estimation on the population in 1981 is obtained by using the Cohort net method.

The explanation concerning the estimation of livestock population and the estimation of availability of meat in 1981 can be seen on table V.11 in Volume III.

9.3.6. Improvement of feeding

9148. 1) The acreage of grassland in South Sulawesi Province is 590,000 ha. In regard to the grass as feed stuffs, estimated average yield of grass per hectare and per year is about 7.3 tons (365 days x 20 kg/ha = 7,300 kg). Based on the number of production of grass in whole South Sulawesi Province per year is estimated 4,307,000 tons. And compared to the population of cattle, it is estimated that the requirement of grass for feeding the cattle in South Sulawesi is 9,214,000 tons per year. Those estimation shows that the shortage amount of grass as feed stuffs in South Sulawesi is 4,907,000 tons for one year.

9149. Thus this deficiency of stuffs is made up by the production of areas outside the grassland, because the feeding in South Sulawesi also graze outside the grassland, i.e. in forest areas, greenery areas, paddy fields and home yards.

Based on the calculation above, the estimated acreage of grazing spot outside the grasslands is  $\frac{4,907,000}{7.3} = 672.191$  ha.

To protect the areas outside the grasslands from damage by cattle, it is necessary to increase the availability of the existing grasslands by improving the grass using high quality pasture grass and pasture legumes. According to the experience of the P.T. Bina Mulya Terhak, the improved availability of grasslands is estimated to be 2.5 heads per ha. So if grasslands in South Sulawesi is improved with pasture grass and pasture legumes, it is estimated to produce 10,767,500 tons, of grass and the production show the surplus of feed stuffs by an amount of 1,553,500 tons of grass or approximately 17%. It means that the improvement of grass lands by pasture grass and pasture legumes will protect 672,191 ha. of land outside the grasslands from disturbance by livestock; with the grassland at an acreage of 590,000 ha, the population of cattle can be raised by 17%.

9150. In order to achieve a planned and directed improvement of grassland and grass, it has to be correlated to the Inpres on Greening and Reforestation. Without improving grassland and grass, the feeding cattle will be an obstruction against the success of reforestation and greening (see table V.7/Volume III).

9151. What needs to find a solution through the government's policy is the attempt to handle the deficiency of grass as feed stuffs.

The introduction of pasture grass and pasture legumes is as yet only at beginning stage)

9152. The utilization of fertilizers in improvement of grasslands and for the increasing production of feed stuffs has been done but it is not so significant yet, because only a small part of the ranch owners have done it.

Other food materials such as rice waste production, corn cake and legumes are adequately available to the feed stuffs.

9153. 2) The using of medicine and vaccin to prevent and to cure cattle diseases show quite a high improvement. It can be seen from the fact that in 1969 the use of vaccin amounted to 254,476 dosis. This amount has increased to 2,158,000 dosis in 1976, which means an increase of about 748% or the average of 94% each year. The availability and utilization of disease prevention apparatuses such as injection needles, canules, microscopes, coolcases, pincets, scissors, laboratory equipments etc, have also increased along with the increase of the use of medicines and vaccin. The amount of utilization of those equipments has increased from 1,000 in 1969 to 2,021 in 1976, which means an increase of about 102% or averagely 13% each year. The use of soil processing equipments at the subsector of husbandry has also risen, especially its use in the implementation of grass plantations.

9.3.7 Conclusion.

9154. The activities on the development of Animal Husbandry through selection and castration gives the better breedstock either cattle or chicken.

The establishment of grass-seedling-gardens and the cultivation of better grass-variety on almost every Kabupaten beside the effort of fattening gives the result that the quality and quantity are better improved and the amount of cattle in South Sulawesi are surprisingly increased.

9155. Through intensification of the effort on preventing and combat diseases, mainly S.E. Anthrax and N.D., the amount of cattle of the people which was infected by infectious disease are limited.

9156. Caused by the project of Pelita, the direction and the development of the Animal Husbandry are gradually in reality which can be directly gives the profit to the farmers.

Because of a better cattle-farming gradually gives the result to a better quality and quantity.

9157. Poultry farming gives more productions on eggs which is going parallel with the increasing of needs and demands.

Before Pelita livestock farming almost practice on the traditional way. During Pelita the effort on livestock farming has changed from traditional to commercial. In the sense of economy it gives some usefull result which is bigger than before. Poultry farming extended increasingly.

#### 9.4. Fisheries

9158. The South Sulawesi Province lies in the position of 1-8 degree of South Latitude and 117-120 degree of East Longitude; it has potential resources of fishery, such as seen on table 9.47. This potential places South Sulawesi in the position as one of the centres of fishery development in East Indonesia, with the following aims:

- a) to satisfy local needs,
- b) to supply for inter-insular trade, especially to Java, and
- c) to supply for export.

9159. The annual average of production achieved during the period 1969-1976 is 126,203 tons, which constitute only about 27% of the whole production potential of South Sulawesi, i.e. 440,000 tons. (see table 9.48 and 9.49. Those fishery resources have not been cultivated intensively due to the following reasons:

- a) the use of traditional fishery equipments,
- b) the restrictiveness of the range in the capacity of sailing boats,
- c) the restricted application of the Five Fishery Principles (Panca Usaha Perikanan) in brackish water fish ponds,
- d) the lack of capital and skill,
- e) the restricted means and device of production, processing and marketing
- f) the small-scale level of fishery industry,
- g) the non-functioning of the fishermen's organization, and
- h) the old-fashioned mental attitude of the fishermen.

9160. The lack of potential which is 440,000 tons minus 146,538 tons equals 293,000 tons, constitute the aims of the fishery development which will be achieved in the future, and it demands a solution including several aspects e.g. technical, economic and social aspects.

##### 9.4.1. Inland fishery

9161. The resources of inland fishery include the following:

- 1) cultivation in brackish water fish ponds at the available acreage of 150,000 ha. estimated production 120,000 ton a year,
- 2) fish cultivation in fresh water,
- 3) fish capture in common waters (lakes, rivers, swamps) at available acreage of about 103,000 ha, production 20,000 tons, and
- 4) fish cultivation in paddy fields.

Table 9.47. Present land utilization and potential area and estimation of production.

No.	Types of fisheries	Availability (1)		Present condition (2)		Potentiality (3)	
		Area (ha)	Production (ton)	Area (ha)	Production (ton)	Area (ha)	Production (ton)
1.	Brackish water ponds (Salty marches)	150,000	120,000	46,000	22,800	104,000	97,200
2.	L a k e s			15,000	5,800		
3.	Fresh water ponds			1,521	350		
4.	Paddy field	103,000	20,000	13,117	1,986	49,660	8,582
5.	S w a m p s			14,636	2,526		
6.	R i v e r s			8,190	706		
7.	Water reservoir			375	50		
8.	Coastal fisheries	3,700 sq. miles	100,000	3,700 sq. miles		3,700 sq. miles	
9.	Off-shore fisheries	73,000 sq. miles	200,000	73,000 sq. miles	112,320	73,000 sq. miles	187,680
	T o t a l	253,000 76,700 sq. miles	440,000	99,339 76,700 sq. miles	146,538	153,660 76,700 sq. miles	293,462

Note : (1) Availability = (2) + (3)

(2) Expansion of brackish water ponds. Area : Kabupaten Luwu, Waajo and Bone.

(3) Expansion of Fresh water ponds. Area : Luwu, Tator, Gowa, Soppeng and Sidrap.

(4) Off-shore fishery area : Makassar strait, Bone Bay and Flores Sea

Source : Dinas Perikanan Sul-Sel.-



Table 9.48. Projection : Development of fishery production in South Sulawesi Province (1973-1983).

Year	Unit: tons.					Annual rate of increase (%)
	Total production	Increasing	Total average of consumption	Exported	Interinsular trade	
1973	130,271	-	121,425	5,106	3,740	-
1974	136,638	6,367	127,960	3,438	5,240	4
1975	152,574	15,936	140,996	4,838	6,740	11
1976	163,091	10,517	100,000	4,851	8,240	6
1977	176,890	13,799	162,300	4,800	9,740	8
1978	192,530	15,640	175,590	5,200	11,740	8
1979	200,020	7,490	180,980	5,300	13,740	3
1980	219,870	19,850	198,530	5,600	15,740	9
1981	234,100	14,230	210,560	5,800	17,740	6
1982	249,000	14,900	223,160	6,100	19,740	6
1983	267,650	18,650	236,350	8,300	21,740	7

Source : Dinas Perikanan, Sul-Sel.-

Table 9.49. Production of fishery sub-sector in South Sulawesi Province

Unit : Tons.

Year	C a p t u r e		C u l t u r e				Grand Total
	Sea	Common Waters	Total	Brackish water	Fresh water	Paddy field	
1969	85,000	9,802	94,802	12,061	432	1,813	14,306
1970	92,000	7,599	99,599	14,348	439	2,114	16,901
1971	97,000	8,056	105,056	15,102	468	3,694	19,264
1972	90,000	5,705	95,705	14,346	327	2,615	16,289
1973	94,000	7,721	101,721	16,769	320	2,615	19,704
1974	107,799	9,298	117,038	21,214	325	1,921	23,460
1975	112,320	9,076	121,396	22,375	335	1,986	24,696
1976	105,887	8,697	114,584	22,714	350	2,055	25,055
Average	98,800	8,237	106,238	17,362	375	2,351	19,967

Source : Dinas Perikanan, Sul-Sel.

1) Brackish water fish culture

9162. In 1974, the relation of the brackish water, and fresh water fish cultivation to the fish cultivation in paddy fields in South Sulawesi was 30:1:4,5 while the relation among the productions was 60:1:10. This quantitative data gives an obvious description of the role of brackish water fish culture in the fishery sub-sector of construction in South Sulawesi at the present time and in the future. Table 9.50 shows the the acreage of brackish water fish ponds being cultivated in South Sulawesi and the present types of cultivation.

9163. In general view, the brackish water cultivators in South Sulawesi Province have quite a good level compared to other provinces in Indonesia, whether it concerns the constructional aspect, irrigation system or the technique of management has achieved an average production rate of 437 kg per ha per year, while that of the entire Indonesian region is about 300 kg. Seeing table 9.50 we get the acreages of the cultivated fish ponds, i.e. 29% the traditional way, 40% semi-intensively, and 22% intensively, and the average production amount for type A : 200-400 kg/ha/year, type B : 400-600 kg, and type C : 600-800 kg.

9164. By means of further improvements in kabupaten Pangkep and Maros, the types C and D are projected with special cultivation of shrimp, and milkfish, with the estimated production rate of about 1,200 kg/ha/year in three harvest times at the acreage of 3,000 ha. In addition to the following factors:

a) technical factor : different processing,  
construction and shape of dikes,  
Sluices,  
parallel/serial irrigation,  
the use of nursery ponds,  
the use of fertilizers and pesticides, and  
the efficient system of seed spreading.

b) socio-economic factor:  
the distance to marketing centres,  
the lack of investment capitals,  
the difficulty in obtaining production  
device, and  
the level of knowledge of the brackish  
water fish farmers themselves.

Table 9.50. Acresage of brackish water fish ponds by type of  
in South Sulawesi Province (1975).

Kabupaten	Acresage	Unit: ha.		
		Type - A Traditional	Type - B Semi-intensive	Type - C Intensive
1. Luwu	2,529	2,428	101	-
4. Wajo	6,439	6,181	258	-
5. Bone	4,810	4,281	529	-
6. Sinjai	435	-	435	-
7. Bulukumba	3,672	-	3,562	110
8. Selayar	58	58	-	-
9. Bantaeng	63	-	63	-
10. Jeneponto	1,861	-	1,600	261
13. U. Padang	1,499	-	1,298	210
14. Maros	4,345	-	-	4,345
15. Pangkep	6,224	-	-	6,224
16. Barru	1,939	-	1,881	58
17. Pare-Pare	31	-	31	-
20. Pinrang	6,396	-	5,884	512
21. Polmas	2,770	-	2,770	-
22. Majene	135	135	-	-
23. Mamuju	65	65	-	-
12. Gowa	63	-	63	-
11. Takalar	1,969	-	1,870	100
Total	45,306	13,148	20,338	11,820
(%)	(100)	(29)	(49)	(22)

Note : 1). Type A : no spreading of fry, no fertilizer and no pesticides.

2). Type B : Spreading of fry, no fertilizer and no pesticides

3). Type C : The Five Fishery Principles.

Source : Laporan tahunan, Dinas Perikanan, Sul-Sel.

9165. Since a few years ago, the following steps have been followed to promote the productivity of brackish water fish ponds:

a) credit assistance from the World Bank extended to brackish fish farmers in two kabupaten-s i.e. Pangkep and Maros with the areal target of 3,000 ha till the end of Pelita II and the product estimation of 800-1,200 kg per ha, in the monoculture of milkfish and mixculture of milkfish and shrimp, 3 times a year's harvesting. The credit term is 5 years at the interest of 1% a month, and

b) Small-scale investment credit from the Bank Indonesia through the BRI in several brackish water potential areas, exclusively those having undergone severe damage due to security disturbance a few years ago.

9166. By this method it is expected to promote productivity and the improvement of living standards for the farmers in the future. Table 9.51 shows the comparison production costs and the profit obtained in each type of cultivation. It is described here that the traditional type of culture has practically no input, while in the C type there is quite a large sum of input costs though it also has quite a large amount of profit.

	<u>Type A</u>	:	<u>Type B</u>	:	<u>Type C</u>
Comparison of input	1	:	10	:	34
Comparison of output	1	:	5,5	:	19,5

By the conditions mentioned above, the improvement of brackish water fish ponds productivity in whole South Sulawesi Province is aimed at the intensification, namely the upgrading from the low level to the higher one by means of counselling and credit extension to the brackish water fish farmers.

9167. The credit assistance from the World Bank since the year 1974/1975 was limited only to 2 Kabupaten-s, but in the future it will be expanded to other potential kabupaten-s.

The first endeavor in those regions is the construction of demonstration ponds (dempond) as a counselling means to the fish farmers, with its additional function as a means of comparison between ponds cultivated rationally and those irrigationally (old-fashioned).

9168. The interesting problem in the development of brackish water production is the problem of fry and shrimp, which have always increased from year to year in the brackish water ponds and the corresponding increase of demand from other regions (Java), (see table 9.52).

Table 9.51 Comparison of cost and benefit in the management of brackish water fish ponds of management per ha. each year in the South Sulawesi Province.

Sorts of activity	Type - A (traditional)		Type - B (semi-intensive)		Type - C (intensive)	
	Amount	Output	Amount	Output	Amount	Output
1. Improvement of dikes	-	-	30,000	-	-	40,000
2. Improvement of sluices	5,000	-	10,000	-	-	40,000
3. Preparation of-nursery ponds	-	-	10,000	-	-	-
4. Purchase of fry:						
- milkfish fry	-	-	15,000 @Rp.3	45,000	-	-
- finegirling	-	-	-	-	1,500 @Rp.20	30,000
- shrimp	-	-	-	-	20,000 @Rp.8	160,000
5. Fertilizers	-	-	-	-	300 kg @Rp.70	21,000
6. Pesticides	-	-	-	-	-1 kg @15,000	15,000
7. Wages for workmen	10,000	-	60,000	-	200,000	-
8. Products sale	200 kg fish	-	shrimp 10 kg @ Rp.2,000	20,000	Shrimp: 300x Rp.2,000	600,000
	mixed: @ Rp.	-	40,000 milkfish 500 kg @ Rp.400,-	200,000	milkfish 450 x Rp.400	180,000
T o t a l	15,000	40,000	255,000	220,000	506,000	780,000
Profit	25,000		65,000		274,000	

Source : Survey production cost and data of PPS Budy Daya Dinas Perikanan Propinsi Sulawesi Selatan (1977).

Table 9.52. Potentiality of coastal aquaculture in South Sulawesi Province.

1) Acreage of brackish water ponds (1971/Unit:ha).

Province	<u>Developed</u>	<u>Potential</u>	<u>Total</u>	<u>%</u>
A c e h	16,254	75,400	91,654	23.5
Jakarta	1,530	-	1,530	0.4
West Java	28,548	10,000	38,548	9.9
Central Java	25,496	1,600	27,096	7.0
East Java	52,362	2,000	54,362	13.9
South Sulawesi	38,761	132,000	170,761	43.8
Others	5,953	(x)	5,953	1.5
Total	168,904	221,000	389,904	100.00

(x) No data available

Source: Review of coastal water resources in relation by R. Djajadiredja and A. Purnomo, Inland Fisheries Research Institute, Bogor, Indonesia.

2) Production of milkfish fry: Indonesia (1970)

Number of fry ( $\times 10^3$ )

<u>P r o v i n c e</u>	<u>Chanos</u>	<u>Prawn</u>
A c e h	41,220	x
West Java	24,476	x
Central Java	10,065	500
East Java	173,950	x
B a l i	4,052	-
West Nusa Tenggara	280	-
East Nusatenggara	-	-
East Kalimantan	182	-
North Sulawesi	117,973	3,450
South-east Sulawesi	750	-
T o t a l	372,948	3,950

Source : Exploration of new Chanos fry resources, A trial for overcoming seed shortage in Java.

3) Supply and need of Chanos fry 1970

<u>Province</u>	<u>Acreage: ha.</u>		<u>Production</u>		<u>Need</u>		<u>Shortage/ surplus</u>
	<u>Bruto</u>	<u>Netto</u>	<u>East monsoon 1000 fry</u>	<u>West monsoon 1000fry</u>	<u>1000fry</u>	<u>Total</u>	
West Java &							
Jakarta	30,900	21,630	24,476	30,900	54,075	84,975	-60,499
Central Java	24,700	17,290	10,065	24,690	43,225	67,915	-57,850
East Java	52,200	36,540	173,950	32,850	91,350	124,200	49,750
South Sula.	37,600	26,320	117,973	37,590	65,800	103,390	14,583
Others			46,484			46,484	-
T o t a l			326,464				

Source : Exploration of new Chanos fry resources,  
A trial for overcoming seed shortage in Java.



For the solution of this problem the following way needs to be found:

- a) the search and expansion of new capturing areas in coastal region,
- b) the improvement of techniques in the cultivation of fry to lessen mortality so that fry can be utilized rationally, and
- c) the utilization of the BPU (Agency of shrimp nursery ponds) of Ujung Pandang in accordance with its function in Providing the needed facilities.

2) Fresh water fish cultivation

9169. The development of production in fresh water fish cultivation is emphasized on the rural lands to get cheap fish as they do not have shores and it is hard for them to get fresh sea fish.

9170. The main objectives are the provision of fry for the following needs:

- a) fish cultivation in people's fishponds,
- b) fish cultivation in rice fields, and
- c) the spreading in common waters (lakes, rivers, water reservoirs and swamps).

9171 Table 9.53 show the production of fresh water fish fry by the BBI (Hatchery) in the region of South Sulawesi, besides the people's Fish Culture in ponds. Compared to the available area of cultivation, the production of those fry is still unable to overcome the deficiency of fry; thus it has to be accompanied by the following steps:

- a) construction of new hatcheries in potential areas,
- b) rehabilitation and improvement of the hatcheries already existing by means of improvement in facilities, and
- c) encouragement and improvement of people's own culture as source of fish fry.

9172. The most outstanding fresh water fish cultivation in South Sulawesi province is found in Kabupaten Tator with the fish cultivation is farmers fish ponds, in paddy fields in other stagnant waters, not ignoring the other Kabupaten-s e.g. Polmas, Lurekang, Soppeng, Sidrap, Luwu and Gowa. This is caused by:

- a) the local condition which fulfills the prerequisites of fishery technique,
- b) the fish farmers who are already fish minded, and
- c) the far distance of those areas from sea fish production centres and the difficulty in communication.

Table 9.54 shows the fresh water fish culture in Kabupaten Tator. The obstruction felt at the present time on the expansion of fishery culture areas and in the promotion of fish culture in rice fields is the use of pesticides in the destroying of rice pests.

9173. Tempe Lake and Sidenreng Lake have an aggregate acreage of 30,000 ha. in the west season. These waters constitute a resource of conserved fish to be traded in interinsular shipment to Java since a few decades ago. Table 9.55 shows the production of the Tempe Lake and the delivery of products through the Kabupaten Wajo since 1961-1972. The highest level of production ever obtained was in 1948, to the amount of 25,000 tons. Viewing the data on production above, the production has decreased from year due to the shallowing of the lake bottom at the rate of 10 cm per year. These waters are practically abounding in the months June and July at the acreage of 30,000 ha and depth of 6-7 m, and in December-May at the acreage of 9,000-10,000 ha and depth of 2-3 m. During the dry season, part of it is planted with corn, sesame and other second are crops.

9174. The composition of fish species captured in Tempe Lake and its surrounding:

- |   |     |
|---|-----|
| a) Puntius  | 50% |
| b) Trichogaster   | 20% |
| c) Cyprinus   | 10% |
| d) Holostoma  | 5%  |
| e) Others, including Opius cephalus, Clarius batrachus, mulets, flat-headed goby etc. |     |

9175. The spreading of fresh water fish fry in lakes and in the swamps surrounding Tempe Lake is conducted by two Kabupaten-s, i.e. Soppeng and Sidrap which own hatcheries according to the table. The average annual capacity of spreading since since 1968 to 1973 was 50,000 up to 1,075,000.--

Table 9.53. Total Number of governmental hatchery and farmers hatchery and its production of fry in South Sulawesi Province.

Kabupaten	Government hatchery			Farmers hatchery	
	Total Number	Acreage (ha.)	Product.of fries(1,000)	Total Number	Product.of fry (1,000)
01. Luwu	7	10,84	743	-	4,000
09. Bantaeng	1	1.30	30	-	-
14. Maros	1	4.17	75	-	-
15. Pangkep	1	3.60	35	-	-
20. Pinrang	-	-	-	-	- 50
21. Polmas	2	2.40	762	-	250
22. Majene	-	-	-	-	-
02. Tator	7	9.11	452	-	12,453
19. Enrekang	2	4.75	112	-	300
18. Sidrap	1	4.17	75	-	800
12. Gowa	3	7.00	173	-	49
03. Soppeng	4	4.99	872	-	169
Total	30	52.33	3.329		17.771

Source : Laporan Tahunan, Dinas Perikanan, Sul-Sel.

Table 9.54 Condition of fishery in Kabupaten Tator

Year	Water fish ponds		River		Paddy field		Number of Fish farmers
	Acreage (ha)	Production (tons)	Acreage (ha)	Production (tons)	Acreage (ha)	Production (tons)	
1972	28.95	2.12	200	11.62	2.126	151.07	11.034
1973	43.30	5.64	200	11.72	2.804	349.77	14.144
1974	36.40	4.58	190	7.69	5.731	845.00	2.444
1975	35.54	4.32	186	5.24	6.389	891.00	2.439
1976	25.50	3.11	166	3.06	6.225	712.00	2.531
Total	173.7	18.62	942	3	28.665	2,949.00	

Source : Dinas Perikanan, Kabupaten Tator.

Table 9.55. Fishery Production and Exported Fish in Wajo

Y e a r	Production in Tempe Lake (tons)	Production in whole Kabupaten (tons) A	Exported fish in raw fish weight (tons) B	Ratio B / A (%)
1961	11,749	14,000	5,631	41
1962	9,060	12,010	4,398	37
1963	5,847	7,955	3,108	39
1964	6,851	9,993	3,792	38
1965	3,393	4,492	2,607	58
1966	1,350	2,314	1,769	76
1967	1,248	1,935	975	50
1968	2,676	4,810	1,989	41
1969	2,177	3,212	1,683	52
1970	1,539	2,748	1,534	56
1971	1,987	2,707	872	32
1972	1,454	1,939	635	33

Source : Preliminary Survey Report of Central South Sulawesi  
water resources Development Project (DPUTL/1974)

9.4.2. Coastal fisheries

9176. The scattered distribution of fishing grounds in the sea of South Sulawesi, i.e. the Makassar Strait, the Bay of Bone, and the Flores Sea, influence the formation of fishermen concentration along the coast, on the islands, at the estuary and the rivers. These places are deliberately used as living quarters within a short distance from the places of capture. The operational grounds of coastal fisheries in South Sulawesi are only 5 to 10 miles away from the coast by using small or medium sized sailing boats. Table 9.56 shows the number of fishermen boats and fishing equipments during the period 1968-1975. On this table we see the decrease in the use of sailing boats and the increase in use of engine boats.

The advantages of this matter are:

- a) the expansion of operational range,
- b) the longer conservation of fish freshness, and
- c) the trips to and from the fishing grounds do not depend on wind and weather any longer.

9177. The fishermen's enthusiasm to produce increase owing to the introduction of modern technology (equipments and techniques of capture) accompanied by the availability of marketing facilities (ice, vehicle etc). Additionally, the government makes available the following device for fishery:

- a) fish landing spots,
- b) improvement of the roads connecting the regions of consumers and producers,
- c) credit agencies and their facilities,
- d) conservation facilities (cool room), and
- e) fishermen utilities (electricity, drinkwater, medicines).

9178. In the endeavor to improve the welfare, income and living of the fishermen as the weak economy class, the government has projected the development of fishermen villages unit are (Wilud) with the following aims:

- a) to organize the activities within a common unity, to recognize new technology in the field of fish capture, product processing and marketing, and

b) to organize fishermen activities within a cooperative bond, tied together through efficient cooperation, the zest for which is deeply rooted in the souls of the villagers.

9179. Basically a fishermen area covers one or more surrounding administrative villages, which possess the following devices:

- a) Rural unit banks, i.e. the B.R.I. - a credit agency serving the fishermen's needs,
- b) Village store, selling tools and equipment of fishermen,
- c) Fish auction, regulating proper prices for fishermen,
- d) EUUD/KUD (Village Unit Cooperation/village Unit Cooperatives), functioning as an organization arranging the business,
- e) drink water, electricity, sanitary clinics for fishermen, and
- f) Fish landing spots.

Location of fishermen's Villages are as follows:

- a) Village of Rangas, kabupaten Majene.
- b) " " Suppa, " Pinrang
- c) " " Lappa, " Sinjai
- d) " " Bajoe, " Bone
- e) " " Takalala, " Luwu
- f) " " Beringin, " Polmas
- g) " " Cambaya, U. Pandang municipal
- h) " " Bonto lanna, kabupaten Takalar
- i) " " Biangkoko, " Bantaeng
- j) " " Tanalemo, " Bulukumba
- k) " " Bontosunggu " Selayar
- l) " " Tunikamaseang, " Maros.

9180. Table 9.57 shows the composition of fish species captured in South Sulawesi waters, the equipments used, the number of crew and the percentage of fish captured in the waters.

#### 9.4.3. Off-shore fisheries

9181. Off-shore fisheries resources with an acreage of about 73,000 square miles have not been run intensively by the fishermen except using old-fashioned tools. Off-shore fishery and the species of fish captured are shown on table 9.57 along with the equipments, the types of boats used, and the number of crew. Off-shore fishery resources are possible to be promoted by means of the following action:

Table 9.56 Condition of fish capturing equipments, the types of vessels used and the amount of fishery products in the waters of South Sulawesi.

Year	Number of equipments			Type of vessels				Production (tons)			
	Nets	Trap	fishing rod	Others	Total	Small	Medium		Large	Engine	Total
1968	10.995	16.682	42.672	684	70,079	26,295	6,959	3,669	-	36,923	86,000
1969	10.573	16.732	42.682	752	79,739	26,544	7,955	4,354	6	39,899	85,000
1970	15.490	19.773	25,055	619	64,507	26,382	8,449	4,309	36	38,906	92,000
1971	13.750	20,000	47,959	6,250	87,954	26,490	8,600	4,050	108	39,248	97,000
1972	10.863	20,100	44,347	13,180	88,490	26,510	8,615	4,055	150	39,330	90,000
1973	15.161	20,653	50,156	11,582	97,552	27,320	9,334	4,030	526	41,210	94,000
1974	15.500	50,300	20,800	11,000	97,000	22,500	9,400	4,050	550	41,500	105,520
1975	16,345	8,421	8.421	17,790	57,810	18,480	6,307	2,558	2,376	29,731	112,320

Source : Laporan Penelitian Pemasaran hasil-hasil perikanan Sulsel oleh UNHAS (1975).



Table 9.57 Composition of fish species captured in the waters of South Sulawesi Province.

No.	Species captured	Percentage	Fishing equipment	Waters	Types of vessels	Number of crew
1.	Tongkol and Cakalang (Euthynnus Sp)	10	Bag nets, fishing rod	Off-shore	Medium size/large boat	6 - 15 pers.
2.	Tuna (Katsuwonus Sp)	8	Fishing rod	Off-shore	Large boats	6 - 15 pers
3.	Layang (Decapterus Sp)	15	Bag nets	Offshore	Large boats	6 - 15 pers.
4.	Ikan terbang (Cypsilurus Sp)	9	Traps	Off-shore	Large boats	8 - 10 pers.
5.	Kembung (Raströlliger Sp)	10	Net	Coastal-waters	Medium sized/large boats	2 - 6 pers.
6.	Teri, tembang (Stolepphorus Sp)	17	Cast net	idem	idem	2 - 6 pers.
7.	Udang (Pencus monodom)	3	Other nets	idem	idem	2 - 6 pers.
8.	Mixed fish	27	Other equipments	idem	idem	2 - 6 pers

Source : Laporan penelitian Pemasaran hasil2 Sulsel oleh UNHAS (1973)

- a) upgrading of the equipments quality and
- b) upgrading of the fleet's quality.

Concentration of off-shore fishery activities are located in the following place :

Rangas, Kabupaten Majene, fishing ground the Makassar Strait,

Ujunglero, Kabupaten Pinrang, fishing ground Makassar Strait,

Kajang, Kabupaten Bulukumba, fishing ground Bay of Bone,

Bajoe, Kabupaten Bone, fishing ground Bay of Bone,

Beringin, Kabupaten Polmas, fishing ground Makassar Strait, and

Galesong, Kabupaten Takalar, special capture of Torani (flying fish).

9182. The distance to the fishing ground is about 20-40 miles from the coast, covered by sailing vessels in 6-10 hours. The capturing time is relatively short, because they have to take into account the time required for the return trip which is only assisted by the wind. Consequently the fish undergo a deterioration. At present there are fishermen using engine boats as transportation device to the fishing ground.

9183. Off-shore fishermen generally apply a product distribution system, with authorities as boat-and-tool owner who finances the capturing operation. Table 9.58 shows the average income of a capturing unit and the percentage of product sharing. These off-shore fishery products are sold as fresh fish in Ujunglero, then they are sent to Pare-Pare and its surroundings, and to other regions in the form of smoked or processed fish. The boat-owner himself handles the sale to other middlemen, who are chiefly women. The fish are processed and then carried in trucks or on horseback to be taken to the inlands at a few kilometers distance. The fish sale using ice is restricted only the big tons, where the roads are in better condition to be covered by vehicles.

#### 9.4.4. Recommendations

9184. Nearly 98% of the whole activity of fishery in Indonesia consists of people's fishery culture, while the rest 2% consists of industrial fishery. With these fishery patterns the developmental point in Pelita II is emphasized on traditional fishery culture, viewing two aspects:

- a) promoting fishery products, both for domestic consumers and for export, and

Table 9.58 Income per unit of equipment and fishermen

Unit: 1,000 Rp.

No.	Kinds of Equipment	Product ton/ha.	Value	Operational cost	Product - Sharing (%) owner 1) Fishermen	Income fish-ermen	Number of fish-ermen per unit	Income per capita/year
1.	Bag net	14.4	1,440.0	423.0	50	513.5	10	51.3
2.	Cast net (P)	8.0	600.0	190.0	50	205.0	6	34.2
3.	Cast net	2.6	130.0	27.1	40	41.2	3	20.6
4.	Other net	2.4	120.0	18.0	50	51.0	3	17.0
5.	Fishing rod (IP)	3.8	273.5	98.7	50	87.4	3	29.4
6.	Fishing rod (P)	0.4	40.0	10.0	60	12.0	2	9.0
7.	Capture	24.0	120.0	13.0	40	64.2	2	21.4
8.	T r a p	4.0	530.0	108.0	50	211.0	8	26.7

Note : 1) owner means owner of the equipment.

Source : Laporan penelitian Pemascaran hasil 12 Perikanan Sulsel  
oleh UNHAS Ujung Pandang.-

- b) upgrading the position of people's fishery so they can obtain a higher level in their economical standard.

9185. The obstructional factors consists of the following weaknesses:

- a) old-fashioned mental attitude,
- b) financial disability,
- c) the condition of the environment which is still isolated from the outside situation,
- d) ineffective system of credits, and
- e) inadequately developed counselling activity.

We need to find solutions to overcome these weaknesses, involving several aspects, such as production, marketing, management and protection.

1) Production

9186. The promotion of fishery products during the Pelita implementation period shows a fluctuating trend. The average rate of production increase in the sector of sea fish capture is 4.4% a year, and in the brackish water culture sector 14.1% a year. Viewing the acreage being cultivated at this time, including sea capture and inland capture, they have not achieved the optimum level of the potential source. The promotion of fishery product is still feasible by means of:

- a) the intensification of brackish water culture techniques and the upgrading to higher level culture, with credit assistance as incentive,
- b) expansion of culture acreage to new regions,
- c) assistance to the fish farmers and fishermen in the form of small scale credit investment from the World Bank and other financial institution.
- d) intensification of sea fish capture, especially off-shore, by improving the quality of the fleet and fishing equipments and fishermen skill, and
- e) provision of fish fry.

9187. For shrimp and milkfish fry, expansion of fry, expansion of fry catching areas is required besides the utilization by the BPU. The BPU. The development of new hatcheries of fresh water fish fry is urgently needed, also the rehabilitation of already existing hatcheries for the development of:

- a) cheap fish in rural lands.
- b) improvement of productivity of the lakes Tempe and Sidenreng and other waters, by spreading new species and the introduction of pen-culture, and
- c) availability of production device in amounts as required by fishermen/ fish farmers at the exact time of need.

2) Marketing

9188. The channel of distribution for the marketing of fish needs to be improved because it is disadvantageous to the fishermen. The availability of ice and coolroom in production centres is urgently needed to maintain the quality of fish as a perishable commodity. The cold chain system of fish marketing needs to be expanded.

9189. The development of fish landing spots in production centres is needed to accelerate the fish marketing process. Fish auction needs to function correctly, aiming at the real objective, and not as a place of taking retribution payments.

3) Management of resources

9190. In coastal fisheries which are densely captured, they need to be transferred to off-shore fish capture with the stimulation of recognizing new technology, to prevent over-fishing:

- a) prohibition of the use of explosives and poisons in capturing fish, especially at sea,
- b) prohibition in using nettings of certain mesh-sizes, both at sea and in other common waters,
- c) prohibition to take rocks (coral reefs) in bulks from the sea, and the pollution of waters,
- d) the destruction of wild plants which are disadvantageous for the common waters.

4) Protection

9191. It is urgent to maintain and manage the resources so well that these waters can continually yield products. Waters not optimally cultivated need to be protected from damage, and waters of dense capture need to be maintained and managed by means of:

- a) the limitation of the number of units and designated capturing tools in designated areas, especially traditional fishery operating regions need to be protected against the use of trawls,
- b) the limitation in the use of large mesh-eyes,

- o) the prohibition to take rocks in bulks,
- d) the maintenance of green belts along the shore against mangrove (about 200-400 meters from the shore),
- e) strong prohibition to use explosives and poisons which will damage the fish potential source in any water, and
- f) reforestation at lake Tempe's environment to prevent erosion, which will cause annual shallowing of the lake, accompanied by an effort to excavate the bottom of the lake.

9.5. Forestry

9.5.1. Condition of the forests in South Sulawesi Province

1) National Forests.

9192. The national forests in South Sulawesi can be classified as follows :

Fixed forest areas	2,058,102 ha.
Reserve forest areas	1,162,991 ha.
Reservation forest areas	1,018 ha.
T o t a l	3,222,111 ha.

Also national forests have the following composition :

Absolute protection forest	1,408,689 ha.
Productive protection forest	1,418,290 ha.
Production forest	394,114 ha.
Reservation forest	1,018 ha.
T o t a l	3,222,111 ha.

9193. 2) Distribution and utilization of forest lands in South Sulawesi Province can be seen on table 9.59.

9194. 3) Nature reservation and maintenance (Perlindungan dan Pelestarian Alam/P.P.A.).

The P.P.A. is a forest area including the nature reservation, wild-life reservation, hunting parks, and picnic parks, having objectives such as for education, culture, and to maintain a good living environment. At present there are only two reservation forests, located both in Kabupaten Maros, as a nature reservation at an acreage of 1,018 ha. This reservation forest will be developed until it reaches 10 % of the entire acreage of the national forest.

4) Forest management.

9195. The Forestry Service of South Sulawesi Province is a Provincial Autonomous Service. (Dinas Kehutanan Daerah Tingkat I Sulawesi Selatan) is administratively responsible to the Governor of South Sulawesi Province and technically responsible to the General Directorate of Forestry, ministry of Agriculture.

9196. At present the division of the Forestry regions is still accommodated to that of the Kabupaten government. According to the referred to division, there are 22 regional forestries in South Sulawesi. The largeness and the potential of the regional forestries depend on the largeness of the Kabupaten (Daerah Tingkat II Kabupaten), so there is a variety of them.

Tabel 9.59. Distribution and utilisation of forest lands in South Sulawesi Province

Kabu - paten	Absolute Protection Forests	Production Protection Forests	Production Forests	Nature Reservat- ion forests	Total
1. Luwu	822,177	175,450	399,500	-	1,337,127
2. Toraja	154,595	-	-	-	154,595
3. Sopp.	45,000	4,000	-	-	49,000
4. Wajo	44,214	-	3,000	-	47,214
5. Bone	140,000	16,660	4,315	-	160,995
6. Sinjai	-	22,938	-	-	22,938
7. Bulukum	-	67,241	-	-	67,241
8. Selayar	-	-	18,000	-	18,000
9. Bantaeng	-	8,535	-	-	8,535
10. Jenepo.	-	15,916	-	-	15,916
11. Takalar	15,624	-	3,825	-	19,449
12. Gowa	19,919	24,950	25,474	-	70,323
13. U.P.	-	-	-	-	-
14. Maros	27,510	-	-	1,018	24,528
15. Pang.	-	17,450	-	-	17,450
16. Barru	9,585	80,000	-	-	89,585
17. Pare2	4,300	-	-	-	4,300
18. Sidrap	68,635	2,510	-	-	71,145
19. Enrek.	60,130	-	-	-	60,130
20. Pinr.	-	63,640	-	-	63,640
21. Polmas	-	248,000	-	-	248,000
22. Majene	-	70,000	-	-	70,000
23. Mamuju	-	600,000	-	-	600,000
<b>Total</b>	<b>1,480,689</b>	<b>1,418,290</b>	<b>394,114</b>	<b>1,018</b>	<b>3,222,111</b>

Source : Dinas Kehutanan Prop. Sulawesi Selatan.



The smallest forest region division unit is divided into the Division of Regional Forestry and the Forest Police Resort according to the acreage and potential of the Kabupaten. A preparation is being made for the division of the South Sulawesi Forest Regions, Accomodated to the management of the River course regions (Daerah aliran Sungai/DAS). Thus the management of the forests is in accordance with the DAS units in South Sulawesi. The forest administration is adapted to the DAS units, because the DAS has distinct borders consisting of mountain-edges or hilltops. A DAS also covers many aspects of the human life, among other things in creating natural resources of soil, water and forest products.

9.5.2. Erosion control and conservation of water resources

1) Bare and critical lands

9197. Bare lands which have generally reached the physically, chemical-ly and economically critical stage are distributed throughout the region of South Sulawesi. These are the lands being forestated and greened since the pre-Repelita times and they are intensified during the Pelita I and II. Table 9.60. shows the acreage and distribution of critical bare lands.

2) Reforestation.

9198. The object reforestation is the bare and critical forest lands within the river course regions (DAS). The acreage of reforestation during the Pelita I and II is shown on table 9.61.

The reforestation costs are mostly obtained from the National Budget and the Provincial Budget.

The acreage of reforestation up to the fourth year of the Pelita II is 38,077 ha distributed throughout all Kabupaten-s and Kotamadya-s in South Sulawesi Province.

The reforestation is planned by the DAS Project and executed by the Bupati and the Camat/Head of Kecamatan.

3) Erosion control and conservation of water resources.

9199. The erosion control and conservation of water resources have been done by the Forest Soil and Water Salvation Project implemented by means of the Project of Reforestation, greening and soil conservation.

Reforestation is implented in the forest areas, while greening and soil conservation is implemented outside the forest areas, i.e. in dry fields and people's home gardens.

Table 9.60. Acres and distribution of bare/critical lands in  
South Sulawesi Province

Unit : Ha.

Kabupaten	Bare lands	Critical lands	T o t a l
<b>I. DAS SADDANG :</b>			
2. Tator	63,460		
19. Enrekang	22,960		
21. Polmas	11,800		
20. <del>Pinnang</del>	23,680		
T o t a l	122,100	432,000	554,100
<b>II. DAS WALAMAE/BILA :</b>			
3. Soppong	19,000		
5. Bone	24,227		
14. Haros	4,000		
18. Sidrap	10,500		
T o t a l	57,727	268,000	325,727
<b>III. DAS JENNEBERANG/KEBILARA :</b>			
10. Jeneponto	25,097		
12. Gowa	15,715		
T o t a l	40,812	336,000	376,812
<b>IV. OTHERS DAS-es :</b>			
1. Luwu	19,432		
4. Wajo	10,000		
6. Sinjai	14,715		
7. Bulukumba	2,000		
8. Selayar	4,000		
9. Bantaeng	7,000		
11. Takalar	7,000		
15. Pangkep	3,300		
16. Barru	29,670		
17. Pare-Pare	4,300		
22. Majene	19,432		
T o t a l	156,556	164,000	300,556
Grand Total	357,195	1,200,000	1,557,195

Source : Dinas Kehutanan Sulawesi Selatan.

Table 9.61. Acreage and distribution of forestation in South Sulawesi Province during the Pelita I and II.

Unit : Ha.

DAS/KABUPATEN	PELITA I	PELITA II*)	T O T A L
<b>I. DAS SADDANG :</b>			
2. T a t o r	7,000	13,000	20,000
19. Enrekang	2,350	6,100	8,450
20. Pinrang	906	3,800	4,706
21. Polmas	1,002	3,500	4,502
T o t a l	11,258	26,400	37,658
<b>II. DAS WAMAMAE/LEILA :</b>			
3. Soppeng	1,325	4,700	6,025
5. Bone	3,250	5,500	8,750
14. Maros	2,090	4,250	6,340
18. Sidrap	1,700	2,750	4,450
T o t a l	8,365	17,200	25,565
<b>III. DAS JELAMBERANG / KELAPA :</b>			
10. Jenepono	750	400	1,150
11. Gowa	5,641	13,300	18,941
T o t a l	6,391	13,700	20,091
<b>IV. Other DAS-es :</b>			
1. Luwu	1,076	1,300	2,376
4. Wajo	750	25	775
6. Sinjai	1,035	850	1,885
7. Bulukamba	100	125	225
8. Selayar	12	25	37
9. Bantaeng	897	900	1,797
11. Takalar	475	630	1,105
15. Pangkep	2,765	700	3,465
16. Barru	809	325	1,134
18. Pare-Pare	935	525	1,460
22. Kajene	726	700	1,426
23. Nasaju	-	225	225
T o t a l	9,580	6,330	15,910
Grand Total	35,594	63,630	99,224

Note : \*) Reforestation up to the fourth year of Pelita II.

Source : Dinas Kehutanan Sulawesi Selatan.

9200. The PHTA chiefly implemented on critical lands within the DAS. The DAS unit is the projects choice because it is the DAS that involves many living environment of people, among others agricultural lands, water supply for agriculture, harbour, industry and drinkwater, while the DAS-es have undergone an acute erosion due to forest stripping which has occurred for long.

9.5.3. Forestry products

1) Forestry products.

9201. The forests in South Sulawesi generally belong to the class of wet tropical forests and some swamp-forests. The various products of the forests include wood and non-wood as follows :

a) The kind of wood : Ebony (*Diospyros celebica*), Mato (*palaquim sp.*), Agathis (*agathis sp.*), Alstonia *sp.*), Palapi (*Madhuka Philipinesis*) and mixed woods, and

b) The kind of non-wood : Cinnamon bark, Tannery bark, Copal, Resin, Rattan, Bamboo and Candle-nuts.

2) Hak Pengusahaan Hutan/H.P.H. (The forest concessions).

9202. Approximately 633,500 ha. of production forests have been privately managed in the form of the H.P.H. This acreage is entirely situated in Luwu and Mamuju, with detailed specification as shown in table 9.62.

Table 9.62. Acreage and location of H.P.H. forests by concessionaire in South Sulawesi Province

No.	Name of HPH owners	Location	Acreage (Ha)
1.	P.T. Nedsko Indonesia	L u w u	125,000
2.	P.T. Serdid Co	L u w u	47,500
3.	P.T. Palopo Timber	L u w u	15,000
4.	P.T. Gemini Timber	L u w u	50,000
5.	P.T. Galat	L u w u	10,000
6.	P.T. Sulwood	M a m u j u	120,000
7.	P.T. Bina Samakta	M a m u j u	70,000
8.	P.T. Gemini Timber Jack I	M a m u j u	45,000
9.	P.T. Hayam Wuruk	M a m u j u	54,000
10.	P.T. Intan Permata	M a m u j u	47,000
11.	P.T. Maskumambang	M a m u j u	50,000
T o t a l			633,500.

3) Forest industries.

9203. The forest industries in South Sulawesi include the Paper Factory, Ply wood Factory, Wood Sawyers and Rattan Processing.

a) The Gowa Paper Factory.

9204. It is situated at the district of Borongloe, Kabupaten Gowa, about 17 km from Ujung Pandang. This factory was established in 1962 and it started production in 1976. The raw materials are bamboo and mixed soft woods (mangrove and cocacia). Its capacity is 60 tons a day. As resource of raw materials, the Gowa Paper Factory has a 24,000 ha of forest concession located near by the factory within the Kabupaten of Gowa. The rate of Production at the present time is 30 tons a day.

b) The Palopo Ply Wood Factory

9205. It is situated in the Kabupaten of Luwu and it was established in 1967. As resource of raw material, this factory not producen any longer since the beginning of 1975.

c) Sawyer Factory

9206. Sawyer factory in South Sulawesi are distributed throughout the Kabupatens and municipals in various sizes. Their raw materials are obtained from interinsular wood, concession wood and people's wood. The products of those factories are to be provincial utilities, except the products of the P.T. Jaya Buana Sawyer Factory, which is ebony and to be exported to Japan.

d) Rattan Processing

9207. The only business of non-wood forest product processing being pioneered by the Provincial Forestry Service is the processing of rattan. Its objective is to promote the quality of rattan for export and interinsular trade. This processing company is expected to start producing within short period.

9.6. Construction of irrigation systems

9208. The construction of irrigation system in South Sulawesi Province covers 4 main activities, i.e. :

- 1) the survey of the development of water resources,
- 2) the construction of new irrigation systems,
- 3) the rehabilitation of irrigation systems, and
- 4) the protection of rice field areas against floods.

9209. In addition to those 4 main activities, the already functioning activities of exploitation and maintenance of irrigation areas are not less significant.

9.6.1. The survey on the development of water resources

9210. This activity is centered in the central part of South Sulawesi, known with its Project of Water resource development in central part of South Sulawesi, which includes an irrigation area plan of 141,000 ha. vast. Within the budget year 1977/1978 a bird's eye view photograph has been prepared along with the ground control; by this time the process is being executed in Japan. (This project is in cooperation with the Japanese government). A further study is planned to be undertaken in the year 1978-1979 concerning the arrangement of a master plan.

9.6.2. The construction of new irrigation systems

This activity includes the following projects:

9211. 1) Luwu Irrigation Project for the acreage plan of 100,000 ha. This project has the technical assistance of the Dutch Government during the composition of the master plan and design of irrigation network within the Project area.

9212. 2) Kelara Irrigation at the Kabupaten Jeneponto. This irrigation area covers an acreage of 6,490 ha. The weir and part of the main network have been completed and the whole main network is planned to be completed in the year 1978/1979. In first and second year of the Pelita III it is planned to complete a supplementary weir which is expected to supply this irrigation area in the dry season for an acreage of about 1,000 ha.

9213 3) Tabotabo Irrigation Project in Kabupaten Pangkep. This area includes an acreage of 11,538 ha. The potential expected for the year 1977 / 1978 is 7,516 ha. It is expected to complete another 473 ha's network in 1978 / 1979. The entire network is planned to be completed by 1981 / 1982.

9214 4) Pamuluku Irrigation Project in Kabupaten Takalar. This irrigation area is estimated to have a potential of a 5,141 ha's acreage. The construction of a weir has been commenced in 1977/1978 and it is planned to be completed in 1978/1979. The completion of the main network is planned for an acreage of 3,406 ha. in the Pelita III and the remainder will be completed in Pelita IV. When it is financially feasible; we will complete the entire network in Pelita III.

9215. 5) Small medium-size Irrigation Project. This project includes as yet the following irrigation areas :

a) Padang Sappa for the acreage plan of 6,573 ha.

By this time it is still the stage of survey and design. The implementation is expected to commence within the coming Pelita III.

b) Mambu for the acreage plan of 2,496 ha. It is the same as the irrigation acreage of Padang Sappa.

c) Lelopacing. The acreage is 3,611 ha. It uses the weir of the Ujung Pandang Drink water Company and up to the budget year 1977/1978 it is planned to complete the main network for an acreage of 1,003 ha. The entire network is expected to be completed during the Pelita III.

d) Bantimurung. This irrigation area was constructed during the Dutch regime, and its completion is included within the Small Medium-size Irrigation Project, the acreage of which is 6,698 ha. The entire main network is also expected to be completed within the coming Pelita III.

9216. 6) Simple Irrigation/SEMERHANA Irrigation Project has irrigation areas scattered throughout the South Sulawesi Province including a plan acreage of 52,126 ha. The whole acreage is planned to be completed in the coming Pelita III. Up to the year 1977/1978 an acreage of 13,078 ha. is planned to be completed.

#### 9.6.3. The rehabilitation of irrigation system

9217. For irrigation areas constructed before the war, its rehabilitation is planned by means of the following projects :

1) The Saddang Sub Project (Prosida), for an acreage of 63,330 ha. including the north Saddang area.

2) The South Sulawesi Rehabilitation Project. Due to restricted finance, it has only covered 10 irrigation areas at the acreage of 67,115 ha. It is planned to cover an acreage of 37,913 ha at the end of the fiscal year 1977/1978. There are actually many irrigation areas which have to be rehabilitated, e.g. Bulo Timurang in Sidrap, Lanrae in Barru, Lajaroko in Soppeng, and others, but they cannot be included within the short term plan due to lack of finance.

#### 9.6.4. The protection of rice field areas against floods

9218. This project includes the activities of flood defense, especially in rivers :

1) The Jeneberang river, a special team is expected to make a study in 1978/1979.

- 2) The Labassang river. The main activity is the making of embankments.
- 3) The Walanae river. Flood control and it is expected to be included in the development plan of the central part of South Sulawesi.
- 4) The Saddang river.
- 5) The Daja river, etc.

9219. To maintain the already constructed network, and to fulfill their functions efficiently, exploitation and the irrigation maintenance have been started, according to the financial capacity. Exploitation is actually a new matter for DPUP South Sulawesi, yet with the existing power at the present time DPUP try to catch up and make for DPUP's arrears concerning the exploitation of irrigation which in Java have been built and implemented continuously since the Dutch occupation. It is a pleasure that the Government has planned to assist DPUP in constructing tertiary networks in the coming years, which will support the implementation of a better irrigation exploitation.

The South Sulawesi Province expect to get a budget for the construction of a tertiary network of 80,000 ha. in the coming three years. The problems faced in the tertiary construction plan is the absence of an adequate map (scale 1/5,000), i.e. a map produced from a bird's eye photography where the paddy field spots will be obviously seen. Besides, DPUP is also short of technical forces who will work for the Irrigation Section. Yet DPUP will still make efforts consistent with out ability and try to implement the program of the tertiary construction.

9220. Other activities which are not less significant are the compilation of hydrological data and hydrometrical one, which have been started since the recent two years by the Irrigation Section of the DPUP. Further it is explained that since 1978/1979 the Irrigation Section of the DPUP has got a technical assistance from the Dutch Government in the field of survey and design. It is expected to yield proposal projects for the future. Thus DPUP made this brief explanation in a very short time. DPUP hope it will be consistent with the BAPPEDA's intention through their letter dated January 6, 1978 no. 06/ATA - 140/78, which received on January 21, 1978.



VOLUME II  
The Final Report on Phase I,  
The Project on RADP/ATA-140.

REPORTING

Composition: K. Ozaki, S. Kikkawa,  
Mono Syamsuddin.  
Reporting: All members of the Team  
(including short-term  
Experts & Counterparts)

EDITING

Composition: K. Ozaki, Tadjuddin Dullah,  
K. Tanabe.  
Drawing: Yusuf M., Syahrullah N.  
Translating: L. Yasin Rakhman.  
Proofreading: A. Azis Lahiya.  
Typing: Fien Latuihamallo,  
Seniwati, Siti Aisha.  
Publishing: The Team of the Project.

February 1979; Ujung Pandang.

ERRATA

Page	Line*	Error	Correction
ii	- 18	Back ground	Background
v	- 1	ield	field
vi	+ 5	infact	infant
	+ 4	insuarey	industry
vii	+ 1	covens	covers
	+ 6	Uvscaployment	Employment
	+ 8	manufactoring	manufacturing
	+ 17	not	net
	+ 21	aise	size
	- 5	arrined	arrival
	-4	transmigrator's	transmigrants
viii	+ 9	P P U	P P L
	+ 13	f o r d	Food
ix	+ 15	to	of
	+ 22	steff	stuff
x	+ 3	forcultivation	for cultivation
	+ 13	gardeus	gardens
	+ 13	Extention	Extension
	+ 14	P.M.U.C.W.U.	P.M.U./C.W.U.
	+ 17	Regoning	rezoning
	+ 19	realigation	realization
	- 14	parsture	pasture
	- 8	utildigation	utilization
	- 2	breackish	brackish
xi	+ 2	breckish	brackish
	+ 6	Government al	Governmental
	- 8	utiligation	utilization
xiii	- 3	coll	cold
1.	+ 5	described	described
	+ 5	fugures	figures
	+ 10	endeavous	endeavours
	+ 11	a integrated	an integrated
	- 10	Developaing	Developing
2	+ 12	beed	beef
	- 6	there are some	some
	- 1	researchs	researches
4	- 17	accoun ts	accounts
5	- 10	in roase	increase
7	Table 2.1.	Infact	Infant
8	+ 3	level	level
	+ 4	industritrializat-	
		ion	industrialization
	- 17	under, Pelita I	under Polita I
11	+ 12	green pea	green gram
12	- 17	sputh	South
12	+ 5(6)	Refer to Table	
		2.7	(Refer to Table 2.7)
	+ 13	green pea	green gram
16	- 10	area been	area has been
25	+ 5	an 10 times	and 10 times
26	+ 11	expressed	expressed
	bottom	Buletin	Bulletin of

\*) + from the top and - = from the bottom.

(Page)	(Line*)	(Error)	(Correction)
28	+ 2	hight	high
	+ 4	ohere	where
	+ 8	perogressed	progressed
	- 9	regarded	retarded
	- 3	Ahare	Share
29	+ 16	popolation	population
	- 17	indicators	indicates
	- 7	shows show	
	- 7	although	although
32	+ 1	phisical	physical
	+ 5	devided	divided
	+ 9	Straits	Strait
	+ 19	ont	one
	- 7	humidity	humidity
	- 3	the month	the 6 month
	- 2	caserly	easterly
33	- 2	two season	two seasons
	+ 6	farn lands	farm hands
	+ 7	largerly	largely
	+ 5	observation rain- fall	rainfall observations
	+ 12	automatoc	automatic
	+ 16	monthly of	monthly
	- 14	usefull	useful
	- 13	Geophysict	Geophysics
	- 8	continous	continuous
	- 6	to two	into two
35	- 4	geographycal	geographical
	- 3	merine	marine
	+ 7	geographycal	geographical
	+ 17	consist	consists
	+ 18	include	includes
	- 5	about	of about
	- 4	are	is
	- 4	bloc located	bloc is located
	- 3	of about	is about
	+ 1	sitiation	situation
38	+ 10	net work	network
	+ 13	as same	the same
	+ 14	almost	most
	- 11	the almost	almost
	- 9	are located	located
40	+ 1	behaviour	behaviour
	+ 5	most	most important
	+ 6	72-	72%
	+ 14	seasons bogins	season lasts
	+ 15	include	included
	- 17	station area	stations are
	- 16	few	a few
	- 15	A obsorved	An observed
	- 9	in	in
	- 8	most drought	driest
- 1	it is observed	the opposite condit-	
43	+ 9	the opposite con- dition	ion is observed
	+ 9	hey	they
	+ 13	a same	a similar
	+ 15	area	areas
	+ 16	the coffee	coffee
	+ 16	tahn	than

(Page)	(Line*)	(Error)	(Correction)
43	- 14	volcanos	volcanic
	- 9	contained	containing
	- 8	are	is
46	+ 5	cristalline	crystalline
	+ 15	spreaded,	spread
	+ 16	is called	are called
	+ 19	are	is
	- 14	the ..... area	..... is
	- 12	area	is
	- 11	condirion	condition
	- 11	the andosol	as andosol
	- 7	hill and side	hillside
		the aqueous	aqueous
	- 6	outside of those area	outside those areas
	- 2	only a few	only in a few
47	+ 1	is	are
	+ 12	Molengrang included	Molengraaf including
	- 13	following	flowing
	- 6	conversation	conservation
	- 2	units	unites
49	+ 8	beside them	besides them
	- 14	discharge of	discharge
50	+ 4	sustem	system
	+ 9	systems	systems
51	+ 2	importants	important
	+ 13	systematic	syatomatic
	+ 14	have been done	have made
	- 10	most large	largest
	- 7	, fluctuate	fluctuates
	- 6	aiming the effect for	aiming at ....
	- 3	are	there is
	- 2	have	has
53	+ 6	happened	happens
	+ 7	a differences	differences
	+ 3	cause	causes
	+ 14	mayority	majority
	- 17	use the	use of the
	- 15	are .... ideas	is ..... idca
	- 10	effective	effectiveness
	- 5	in	under
	- 3	canal	canals
54	+ 3	to carry out	to be carried out
	+ 5	significanco	significant
	+ 7	way	ways
	+ 10	cul	cut
	- 10	this data	these data
55	+ 1 (2)	important as same as	as important as
	+ 3	are carried	is carried
	- 11	this reason is why	This is the reason why
	- 10	are	is
	- 8	now	new
	- 7	have been damage	has been damaged
	- 5	growing	growth
	- 3	alluvian	alluvial

(Page)	(Line*)	(Error)	(Correction)
56	+ 1	are necessity	necessitates
	+ 4	should taken	should be taken
	+ 12	agencies	agency
57	+ 1	are	is
	+ 2	as	is as
	+ 5	acreage of the	--- (omit)
	- 7	widest ...five bloc	the widest ..... five bloccs
	- 6	of the covers with	of the area is covered by
	- 3	almost	most
	- 3	covers	is covered
	- 2	And the	And in the
	- 1	grassland estates	grasslands estate
59	Table top right		
61	+ 19	then	than
	- 13	chi	(omit)
	- 2	it estimated	it is estimated
62	+ 2	to the	to as the
64	- 9	is meaned	means
	- 7	devided with	divided by
	- 5	no calculated become	not calculated because of
65	+ 6	determinid	determined
67	+ 3	mountaneuous	mountainous
	- 15	Makassar Straits	the Strait of Makassar
68	- 9	allien	aliens
	- 5	Province	(omit)
69	Table	1. Nort 5. Est	North West
	- 6	Geografi	Geographic
	- 5	A graris	Agrarian
	- 4	Intern	Interim
70	+ 5	Kabupaten's	Kabupaten-s
	+ 7	the Ujung Pandang	the city Ujung Pandang
72	+ 8	t n	than
	- 5	tha	the
75	+ 4	Government	Government
	+ 16	schol	school
	+ 19	popolation	population
79	+ 12	Shout	South
	+ 15	industrys	industry's
80	+ 6	companis	companies
	+ 8	puribumi	pribumi
82	+ 5	augar	sugar
	+ 7	exhange	exchange
85	+ 4	devided	is divided
	+ 8	devided	divided
	+ 10	devided	divided
	- 13	farmers	farmers of the
	+ 14	devided more	are divided again into
	+ 15	horticultura	horticulture
86	- 7	shown figure	shown in figure
	- 14	cooperated	in cooperation with
	- 12	it clarified	it is clarified
87	- 6	percentage	percentages
92	- 15	pnengarah	penggarap
	- 14	devided for	divided into
	- 14	showing	shown

(Page)	(Line*)	(Error)	(Correction)
101	+ 7	Capalagiang	Campalagiang
102	- 15	pther	other
107	+ 2	to	from
	+ 12	conditions	condition
	+ 16	. which	, which
108	+ 5	elfare	welfare
109	+ 5	absentecland lords	absentee landlords
	+ 13	anymarketable	any marketable
110	+ 15	the some	some
111	+ 3	half of	half of
	+ 8	middlemont	middlomen
	+ 11	the	the
	+ 14	croppers	croppers
112	+ 15	consuptive	consumptive
	- 16	The Team of .....	The ATA-140 Team
	- 5	requetod	requested
113	+ 17	expandst	expanded
	- 15	using	use of
114	+ 8	field of socio-economic	socio-economic field
	- 14	chinese	Chinese cabbage
	- 2	as far	as long
116	+ 5	theroe	three
117	+ 13	is	are
	- 14	captured	capture
	- 13	cultured	culture
	- 8	middle	medium size
	- 6	area	areas
118	- 7	trpic	tropic
120	+ 7	shawing	showing
	- 12	pure hasin;	purchasing
125	+ 1	there is	there are
126	+ 2	comparision	comparison
	+ 3	formulation	formulation of
128	+ 5	particularly	particularly, the
	+ 12	tomatos	tomatoes
	+ 13	Enrekant	Enrekang
132	+ 1	Systimatic	Systematic
	+ 6	Constrain	Constrains
	- 5	result a fall in	resultin a fall of
133	+ 1	at low the physical	low level on the physical.
	+ 2	has little	have less
	+ 4	traffic	traffic
	+ 9	to that	to do that
	+ 10	collecters	collectors
	+ 11	self-sufficient	Self-sufficient
	+ 12	merchandias	merchandise
	+ 16	are	is a
	- 14	farming	farmers
	- 11	custom	customs
	- 10	payed	paid
135	+ 3	colectively	collectively
	+ 10	proverty	poverty
140	- 6	accomplishment	accomplishment
142	+ 15	fuctioning	functioning
143	- 3	at	(omit)
144	- 7	netters	matters
	- 9	Eztension	Extension

(Page)	(Line*)	(Error)	(Correction)
145	+ 5	investivation	investigation
	+ 10	solut	solution
	- 3	quiding	guiding
146	+ 3	creteria	criteria
	+ 5	60	to
147	+ 3	censist	consist
154	+ 12	whre	where
	+ 12	woks	works
156	- 6	plot	(omit)
172	- 2	bebame	became
173	+ 6	laage	large
174	+ 1	Nort	North
	+ 5	pea	gram
175	- 13	comparises	comprises
	- 12	earten	earthen
176	- 6	comparises	comprises
178	+ 16	d crease	decrease
	- 14	tungoro	tungro
180	- 1	intensificatiob	intensification
189	+ 19	aharply	sharply
	- 4	dufference	difference
193	+ 9	menawhile	meanwhile
	+ 11	cathment	catchment
	+ 17	lement	elements
	+ 17	taht	that
	- 15	33.2	33.2%
	- 14	iinthe	in the
194	+ 2	ehere	where
204	- 6	thebeans	the beans
	- 4	pea	gram
205	- 7	palnted	planted
210	+ 11	theshipment	the shipment
	- 14	photoperiod	photo period
	- 4	pring	spring
217	+ 9	condust	conduct
223	+ 7	show-ed	showed
	- 6	managene	management
227	+ 3	pcking	packing
	+ 12	differenr	different
228	+ 4	Suppying	supplying
229	+ 13	ans	and
233	+ 3	rach	ranch
	+ 6	vigures	figures
	+ 7	particularir	particularly
	- 15	intectious	infectious
234	- 11	Extention	Extension
236	- 3	cowsand	cattle and
237	- 13	meight	weight
	- 12	priod	period
238	- 12	rovince	province
242	+ 4	buffalows	buffaloes
250	- 6	obstuction	obstruction
253	+ 2	Pronce	Province
254	- 2	Malassar Starit	Strait of Makassar
		Bone Bay	Gulf of Bone
257	+ 3	diolds	fields
	+ 5	rone	role
264	- 2	since since	since
272	+ 18	fisherneb	fishermen

(Page)	(Line*)	(Error)	(Correction)
272	- 15	prodict	product
274	- 18	optumim	optimum
	- 17	fesible	feasible
	- 3	The BPU	(omit)
275	+ 2	improevant	improvement
	+ 13	production	production
279	- 5	Salvation	Conservation
282	+ 2	projects	project's
283	+ 14	not producen	has not produced
	+ 17	factory	factories
286	- 11	out	our
	- 8	hydromentrical	hydrometrical
	.. 4	ia	is

---

Note: \*) + = from the top and - = from the bottom.



