

5. *Project Evaluation (Results of Survey and Evaluation Missions)*

The record of discussions (R/D) for this project-type technical assistance project was signed and exchanged on 26th January 1991, with the technical assistance concerned beginning from the same day. A survey team was dispatched for planning discussions in April 1992 and drew up a Tentative Scheme for Implementation (TSI). A JICA Technical Guidance Team was dispatched in October 1993 to confirm the suitability of the project direction. At the same time, however, the JICA team indicated some delays in the progress of project activities and revised some aspects of the TSI. It also expressed concern over the likelihood of attaining the project's objectives within the time frame allowed. In its final evaluation, the JICA team indicated the necessity of revising the period of assistance.

The end of this project was held back and discussions were held with the government agencies concerned in August 1995, when it was decided to conduct the final evaluation survey. The survey team was dispatched to the area for the 14 days between 24th September and 7th October 1995 to conduct the closing evaluation. This project has been evaluated as follows, based on the findings of these surveys.

5.1 Plan discussion survey (April 1992)

(1) Survey objective

In this project, the TSI was exchanged together with the R/D at the time of the implementation discussion survey, but around one year after the R/D went into effect progress was already considerably behind that called for in the TSI. A JICA expert team met for discussions with the related Indonesian agencies (the Bureau of Planning of the Ministry of Agriculture, the Southeast Sulawesi Provincial Office of the Ministry of Agriculture and the Provincial Government of Southeast Sulawesi) to check the exact state of progress, find the problems and decide how best to proceed. The objective of this plan discussion survey was to draw up a plan for the future implementation of the project based on these discussions.

(2) Survey content

The specific points included in the survey are listed below. These points were determined through discussions with the parties concerned before the team was dispatched.

- a) Checking the state of progress in each area of assistance.
- b) The survey and examination of the points which were impeding the progress of the

project.

- c) Examination, from expert and technical standpoints, of the content of the assistance which should be included in future projects.
- d) Summary of the implementation plan
 - i) Preparation of an implementation plan for FY1991/92.
 - ii) Review of the entire five-year implementation plan.
- e) Discussion and coordination with the Indonesian side concerning the above, and a signing and exchange of minutes.

(3) The survey team

The survey team was dispatched for 14 days between 24th February and 8th March 1992. The composition of the team and the names of its members are summarized in Table 5 - 1.

Table 5 - 1 Planning Arrangement Survey Team

Assignment	Member's Name	Belonging Organization
General Supervision	Kazuyoshi Kamitoko	Section of Development, Bureau of Structure Improvement, MAFF
Farming Guidance	Michito Yamamoto	Section of Upland Agricultural Development, Bureau of Farm Produce and Horticulture, MAFF
Construction Planning	Seinen Doshyo	Department of Overseas Activities, JALDA
Agriculture Rural / Land Improvement	Hironori Ogata	Section of Design, Bureau of Structure Improvement, MAFF
Business Coordination	Yoshitaka Washimi	Section of Agricultural Technical Cooperation, Department of Agricultural Development, Cooperation, JICA

The organizations involved in the planning arrangement survey are as follows.

- a) Ministry of Agriculture (Chief, Bureau of Planning and others)
- b) National Development Planning Board
- c) Regional Office of Southeast Sulawesi Province, MOA
- d) Provincial Government of Southeast Sulawesi Province (Governor of Province, other related offices such as BAPPEDA)
- e) Japan-related agencies (the relevant secretary of the embassy, the JICA Resident Representative and the JICA expert seconded to the Ministry of Agriculture).
- f) The JICA expert team (seven members).

(4) Summary of survey conclusions

a) The state of the project's progress

- i) Although the R/D on technical assistance between the Japanese and Indonesian sides was signed and exchanged on 26th January 1991, and the project started on 1st March, the seven members of the long-term expert team were not assembled before October of that year. After the long-term expert team was complete it was successful in building the project execution scheme by encouraging the Indonesian side and posting two counterparts in each related department. However, one counterpart in each department was only working part time, which was an inadequate system.
- ii) The delivery of the equipment provided was delayed, so the work of transferring specific skills for the use of construction and agricultural machinery had not begun, and neither had the infrastructure improvement work. However, according to reports received after the survey team returned to Japan, the arrival of equipment on site had already begun and the execution scheme for technical assistance was being formed. The preparations for infrastructure improvements, namely the ground surveying and implementation design for Ranometo Village (the site of the first construction start) were complete, and construction was to begin immediately.
- iii) Training activities targeting the Regional Office of the Ministry of Agriculture, Provincial government staff, key farmers and others had not begun due to a delay in the budget instructions, but we have received a report that this problem was also solved soon after the survey team returned to Japan and the implementation of training began.
- iv) Farming guidance was also delayed beyond the planned start by a similar delay in the budget instructions, but the farming plan for Ranometo, the trial introduction of vegetables, the trial cultivation of rice by direct planting, and other preparatory elements were proceeding steadily.

(b) The project's problems

- i) In addition to this project's "hard" aspects, it is significant that local representatives, and the officials concerned in local government joined in the farmers' participation to take the initiative in the project's planning process. The counterparts involved in all types of technological transfer also played an important role. Two counterparts were posted in each department, but as they were all very young the age difference between them and the long-term experts was perhaps too great, they lacked standing as instructors in the communities, and there were not enough people with suitable

specialist skills. Also, of the two counterparts in each department, one was only serving part time, which may have been due to a lack of confidence for full-time work.

- ii) Related government staff, key farmers, farmers' groups and others must receive training in fields such as cultivation, land reclamation and the reinforcement of farmers' organizations, but there is no clear willingness on the part of the Indonesian Government to spend money on such training. The Indonesian Government must establish proper budgetary measures for achieving the aims of the project.
- iii) The implementation of the project requires the long-term experts to make short stays in parts of the project area other than Ranometo, which is near to the project office.

(c) Examination of future project implementation

- i) The survey team visited the governor of South Sulawesi to encourage him to cooperate with the project for its smooth implementation. The team found that governor himself adheres to the concept of comprehensive rural development (GERSAMATA) and therefore supports the project strongly and has a high opinion of it.
- ii) Meetings were held in the field between the survey team and the chief of the Regional Office of the Ministry of Agriculture, the representative of the Regional Development Planning Agency in Southeast Sulawesi Province and other counterparts and long-term experts. The results of exchanges of views on the treatment of counterparts, early implementation of plans etc. will be reflected in a joint meeting to be held in Jakarta at a later date.
- iii) The first joint meeting for this project was held in Jakarta. It confirmed the implementation plan discussed at the second on-site coordination meeting, as well as discussing other necessary matters. This meeting discussed the detailed five-year plan for the TSI drawn up on 26th January 1991 and the implementation plan for 1992. Minutes for the meeting were signed and exchanged.
- iv) In the above minutes, the points to receive greater efforts from the Indonesian side were the posting of two full-time counterparts to each department and the provision of sufficient budget for the implementation of the project (particularly the costs of training). These points were agreed, signed and exchanged.

d) The opinions of the survey team

- i) Although there were delays in the first year of the project's implementation, these were only in the early stages and since then the execution scheme has been built up,

with strong efforts from the expert team, cooperation with counterparts and delivery of mechanical equipment to the field. Moreover, the Ministry of Agriculture and other agencies have shown the Indonesian side's enthusiasm for the project. Bearing these positive factors in mind, there does not seem to be any need at this time for a major revision of the five-year plan for the TSI. In future, JICA technical guidance teams should give this matter further consideration if the situation in the field merits it.

- ii) Due to the nature of this project, the self-help efforts of the Indonesians on the receiving side are essential, a point which this survey team emphasized to the Indonesian side. Regrettably, BAPPENAS, which is a member of the joint meeting and the agency in charge of the project's finances, did not attend meetings. We have asked the JICA Indonesian office to encourage BAPPENAS to participate in future.
- iii) Farming guidance for the "soft" aspects of the project is important to make full use of the improvements made to agricultural infrastructure under this project, in order to produce improvements in the living conditions of farmers. However, despite the importance and breadth of this project, only one long-term expert is assigned to this work. The dispatch of a unit of young overseas cooperation volunteers should be considered to improve this situation.

5.2. Interim evaluation (October 1993)

(1) Survey objective

JICA Inspection and Guidance Survey Team was dispatched to conduct this interim evaluation. The guidelines for the survey were to study the roles of both sides with particular reference to the TSI based on the R/D, the record of investment of funds, the activity in the project to date, how far the project objectives were being attained, and other aspects, as well as discussing the action plan for the remainder of the project period with those concerned. As the year of the survey was the third, marking the midpoint of the project period, the survey was to study the roles of the Japanese and Indonesian sides and their records of investment of funds, the activity in the project to date, how far the project objectives were being attained, and other factors, as well as discussing the action plan for the future with those concerned. These investigations were to give guidance and advice on cooperation and the management of the project in order to enable effective technical cooperation work and the completion of the project's targets within the five years. If necessary, suggestions were to be made to put the project back on course.

(2) Ascertaining and evaluating the state of progress of project activity

- a) The record of investment of funds, the activity in the project to date, and the progress towards project objectives were investigated on the basis of the TSI and, where there were delays in any parts of the project, an estimate was made of whether or not the work was going to be finished within the duration of the project cooperation.
- b) Problems were examined and countermeasures for the future were studied.
- c) Problems in technical aspects of the project, or in its implementation, were identified, and guidance and advice was given on countermeasures and the content of tasks for the coming year of the project.
- d) Discussions and deliberations were held concerning the content of the next year's cooperation implementation plan.
- e) Measures which should be taken by each side (Indonesia and Japan) in the next year for the short-term dispatch of experts, training of counterparts and planned provision of equipment were examined.
- f) The usage of equipment provided, the implementation of project work at local cost and the acceptance of trainees were investigated.
- g) The usage and maintenance of equipment and materials provided under this project was checked. Where necessary, appropriate guidance was given on its use, management and maintenance.
- h) Examination of other points.

(3) Interim evaluation method

JICA's evaluation of project-type technical assistance is based on the "Evaluation guidelines", which were drawn up in 1991 and are now under trial. These guidelines aim to achieve objective evaluation and operation based on a program which forms matrix of the relations between the project objectives, its content, investment and preconditions. The guidelines cover interim evaluation as well as evaluation at the end of the project. In this project the R/D and TSI were concluded and executed through the old methods without devising a log frame, so some do not believe it fits the evaluation guidelines, but it does fit for the purpose of objective evaluation. Therefore the evaluation was attempted as closely as possible to the guidelines, with the survey team providing suitable guidance and advice to both the Indonesian and Japanese sides to contribute to the success of the project.

(4) The survey team

The survey team was dispatched for 12 days between 24th August and 4th September 1993. The composition of the team and the names of its members are summarized in Table 5 - 2.

Table 5 - 2 Inspection and Guidance Survey Team

Assignment	Member's Name	Belonging Organization
Leader/General Supervision	Rhuhei Funano	Section of Design, Bureau of Structure Improvement, MAFF
Vice-Leader/ Technical Cooperation	Yosbiaki Kano	Section of Agricultural Technical Cooperation, Department of Agricultural Development Cooperation, JICA
Regional Development/ Agricultural Land Improvement	Seinen Doshyo	Department of Internal Business Activities, JALDA
Farming Farmers Organization	Kazuhiro Akyu	Section of Young Farmer's Counter Plan, Division of Extension Education, Bureau of Farm Sericulture and Horticulture, MAFF
Business Coordination	Osamu Kosegawa	Section of Agricultural Technical Cooperation, Department of Agricultural Development Cooperation, JICA

The main organizations involved in the survey are as follows.

- a) Ministry of Agriculture (Chief, Bureau of Planning and others)
- b) National Development Planning Board
- c) Japan-related agencies (the relevant secretary of the embassy, the consul general of Ujung Pandang, the JICA Resident Representative and others)
- d) The JICA expert team (eight members)

(5) Summary of the interim evaluation

- a) The state of the project's progress
 - i) The R/D for this project came into effect from March 1991, and the first team of experts was dispatched in June of that year to discuss specific methods of cooperation with their counterparts (C/Ps) and conduct the detailed field survey. Based on those discussions, the bulldozers, backhoes, dump trucks and other heavy equipment important for the initial stages of the project cooperation were procured locally, but the delivery of this equipment was delayed, being delivered between March and August 1992. In this period the delays in dispatch of experts from Japan and the delivery of heavy equipment were compounded by delays in filling the counterpart posts. Furthermore, many of the counterparts appointed were not

adequately experienced in the experts' fields. Overall, a delay of around one year resulted, relative to the initial plan.

- ii) However, as the land development, construction of agricultural and rural facilities and other facilities such as model fields were completed in Ranometo, which was where construction began earliest, the perception of the project's direction and effects on both the sides became clearer. As this was the first participatory development project, both the sides appear to have experienced some uncertainty over how to proceed in the initial stages of the project's implementation. Deliberations and coordination took longer than expected, but by now it is our impression that the completion of works in Ranometo has given a clearer sense of the way forward. From now on both sides will approach the implementation of this project with much greater confidence. For future cooperation, the technical ability of the counterparts can be expected to advance rapidly, as they are well-versed in the project's implementation.
- iii) The establishment of a fund in Ranometo, the first village, built from the contribution of a portion of farmers' wages, is a good example of the strengthening of farmers' organizations. In the other seven villages, the organization process itself is still at the starting point.

b) Causes for concern in the project

- i) When the field survey of all the villages scheduled to receive cooperation was conducted, it became clear that the water catchment area for each site was small, so the main concern was to secure enough water for irrigation in the rainy season. The area clearly could not gather enough water for more than very limited irrigation in the dry season. Compared to areas with adequate water catchment where it is possible to grow two crops of paddy rice each year, the conditions for agricultural development in the eight villages due to receive cooperation were severe. Areas with adequate water catchment were either areas that had already benefited from irrigation projects by the Ministry of Public Works, or had cleared and reclaimed land themselves to build paddy fields. In Southeast Sulawesi Province, a majority of the land suffered from conditions as harsh as those faced by the eight project villages. The eight villages selected have various characteristics which could make them valuable models for agricultural and rural development stimulated by some form of public investment. In this sense, the selection of these villages was clearly appropriate.
- ii) The expert and counterparts responsible for demonstration of cultivation and farming techniques have to handle a wide variety of crops, including paddy rice, upland

crops and estate crops. The dominant crop patterns in the areas targeted for cooperation were wet-season paddy rice in low-lying areas and, in upland fields, perennial estate crops or wet-season crops such as maize and soy beans. The project cooperation areas have small water catchment areas, with no reliable source of water for the dry season. Therefore to establish a form of stable cropping system suitable for the area, the right kinds of model fields should be built and used. Specifically, the crop development targets should be high-yielding paddy rice for the wet season crop and crops for the dry season which require less water than paddy rice does (soy beans, maize, vegetables etc.). These should be cultivated intensively on a land area calculated from the volume of water available for irrigation.

- iii) Pest damage from types of wild boars and rats unseen in Japan is a major obstacle to crop cultivation. The reduction of this kind of damage is another reason why the cultivation models demonstrated should be held to a few carefully-selected types.

c) Future project implementation

- i) The project sites scheduled for future development are situated in remote areas, so it will be extremely difficult to make up for lost time and complete these areas on schedule. It is likely that the period of cooperation will have to be reviewed at the time of the final evaluation survey.
- ii) At the joint committee meeting held in April, Southeast Sulawesi Province suggested that two of the initially-planned villages be replaced with two other villages, but no such proposal was made in recent meetings with the state governor and the head of the BAPPEDA office. This is probably because the government of Southeast Sulawesi Province wants to make its best efforts to complete the eight villages of the initial plan. The Japanese side will also have to take flexible action for the completion of the eight villages, including budgetary measures.
- iii) The group leader has sent a letter to the Indonesian side urging appropriate measures on both sides of the budget.

d) The opinions of the survey team

- i) In a meeting between the Vice-Minister of MOA, the Vice-Chairman of the Agriculture Bureau of BAPPENAS, the Governor of Southeast Sulawesi Province, the chief of the Provincial Office of Agriculture and others, the Indonesian side was united in emphasizing sustainability, the eradication of poverty and reduction of regional disparities as their prime concerns in the direction of agricultural policy. The content of this project fits neatly with the concerns of the Indonesian side, and it was

our impression that they were deeply concerned with the outcome of the project. Therefore, in the implementation of this project, it is important that the Japanese side be flexible in accommodating Indonesian policy intentions out of consideration for the strength of these intentions.

- ii) In the villages of Ranometo and Palangga the soil improvement and the construction of agricultural and village facilities are now complete or nearing completion. The counterparts and farmers will gain valuable experience by actually using these facilities. The plan for these works in the next villages should be flexibly reviewed in the light of the application of this experience. This approach is one which must be built into the project, with the right level of technology and scale of budget for the country always in mind, so that after the cooperation period ends, Indonesia will be able to use this project as a model to pursue further sustainable agricultural development independently. For example, considerable sums were invested in the construction of water intakes and diversion works, but their safety and functionality demands adequate structure. Even so, the planning and design of these facilities must be considered together with the counterparts with much closer consideration of their costs. This consideration should include the use of cheaper materials, simpler structures and lagoons etc. As for the livestock market and seed stores, the usage of these facilities in Ranometo should be closely examined so that they will be of reference for the plans for the next village. The facilities for rice polishing and drying, and for training, have already been improved to make them easier for counterparts and farmers to use. These changes reflect the experience gained in Ranometo and Palangga. A similarly flexible approach should be taken to all designs in the future.
- iii) Farmers in the region usually own 3-5 head of beef cattle which are allowed to graze freely. There is ample scope for examining further applications for these cattle, such as using them as draft animals, as settler farmers from Bali do, or rearing them intensively to produce fertilizer. If the use of cattle is fully incorporated into farming practice, it could serve to maintain soil quality and diversify dry-season agriculture with the introduction of grasses for pasture.
- iv) Once the infrastructure has been improved, the "soft" service-related fields which improve farming practice and strengthen farmers' organizations play a major role in maintaining the project's forward momentum. In the project area the villages are a diverse ethnic mix of indigenous Tolaki with Bugi settlers and other settlers from Java and Bali. Each of these peoples has its own culture and customs and their levels of farming expertise also differ. A thorough survey of these peoples and an approach which suits the characteristics of each is vital for the implementation of this project.

- v) Working groups have been set up to build the farmers' enthusiasm for the project through participation in the construction of irrigation canals, and to enable smoother implementation of the project. Organizations are being built for the operation and maintenance management of most of the equipment provided, and of the facilities constructed. They are also expected to contribute to the sustainability of the project. In Ranometo a portion of the wages earned from the participation of nine farmers' groups in the construction of irrigation canals was used to establish a fund totaling Rp3.2 million.

The voluntary creation of such independent funds by the farmers produces great benefits for the project. The Water Management Associations are being set up as planned and will begin service in the future. The farmers' future application and management of the funds which have been established should be studied together with the farmers as a way of raising their sense of participation. Some progress has been seen in Ranometo by now, but organization of farmers in the other seven villages has not even begun.

The farmers' organizations in Ranometo should be built up with government support so that the influence of their example can spread to the other seven villages. This kind of organization of the farmers is a vitally important issue, one which has a decisive effect on the evaluation of the project. At this stage of the project, steady progress must be made in this regard, and at the same time, the effects of the project should be aggressively publicized whenever important people visit the area, and through the use of billboards etc.

5.3 Final evaluation (November 1995)

(1) Survey objective

The completion of the project was held back and a final evaluation survey team was dispatched in September 1995 with the following objectives:

- a) An integrated evaluation of the project's achievements during its duration (including scheduled results).
- b) Discussions regarding measures which should be taken after the end of the cooperation period, with the resulting report and recommendations to be submitted to those concerned in the governments of both countries.
- c) Suggestions for feeding back the results of this evaluation to the cooperation planning and implementation of other projects of this type, so that their technical

assistance can be implemented more appropriately and effectively.

(2) The survey team

This survey was a joint effort by the Indonesian and Japanese Governments. The Japanese survey team was dispatched for 14 days between 24th September and 7th October 1995. The composition of the bilateral survey team and the names of its members are listed in Table 5 - 3.

Table 5 - 3 Final Evaluation Survey Team

Assignment	Member's Name	Belonging Organization
(Japanese Side)		
Leader/General Supervision/Regional Development	Koji Harada	Division of Construction, Bureau of Tokai Regional Agricultural Administration, MAFF
Rural Land Improvement	Shin Imai	Section of Overseas Land Improvement Technology, Division of Construction, Bureau of Structure Improvement, MAFF
Construction Management/Machinery Operation Maintenance Management	Junya Yamauchi	Section of Overseas Land Improvement Technology, Division of Construction, Bureau of Structure Improvement, MAFF
Farming Guidance Strengthening of Farmer's Organization	Hiroyuki Ito	Section of Farm Products, Bureau of Farm Sericulture and Horticulture, MAFF
Planning Evaluation	Masayuki Takahashi	Section of Agricultural Technical Cooperation, Department of Agricultural Development Cooperation, JICA
(Indonesian Side)		
Leader/General Supervision/Regional Supervision	Mr. Iskander Andi Nuhung	Division of Analysis and Evaluation Bureau of Planning, Ministry of Agriculture (MOA)
Rural Land Improvement	Mr. Wahyu Chayo Suryono	Section of Designing and Planning Regional Office in Southeast Sulawesi Province, Ministry of Public Works
Construction Management/Machinery Operation, Maintenance Management	Mr. Alnasar Dewang	Section of Water Management Public Works Office in Southeast Sulawesi Province
Farming Guidance/Strengthening of Farmer's Organization	Mr. Gayatri Rana	Division of Program Management Bureau of Planning, MOA
Planning Evaluation	Mr. Susilo Widodo	Division of Analysis and Evaluation Bureau of Planning, MOA

The main agencies involved in discussions are as follows:

- a) Ministry of Agriculture (Chief, Bureau of Planning and others)
- b) National Development Planning Board
- c) Regional Office of Southeast Sulawesi Province, MOA

- d) Provincial Government of Southeast Sulawesi (provincial governor and others).
- e) Provincial and regional agencies (related district mayors)
- f) Japan-related agencies (the relevant secretary and councilor of the embassy, the JICA Resident Representative and others)
- g) All experts and counterparts involved in the project

(3) Methods employed in the final survey

a) Survey method

The survey, conducted jointly with an Indonesian survey team, evaluated the points detailed below in line with the "Evaluation Guidelines" for project-type technical assistance projects, although in the minutes the format was rearranged to describe the attainment of targets and effects together. A performance matrix was drawn up and used as the basis of discussion to assist in the smooth progress of evaluation meetings with the Indonesian survey team.

- i) Attainment of targets
 - ii) The survey investigated consistency with the overall plan, attainment of targets, attainment of output and input targets, and reasons for attainment and non-attainment.
 - iii) Project effects
 - iv) The nature of the effects of the project, their propagation, the range of beneficiaries and other aspects were analyzed. Also, considering the project's role as a model for agricultural and rural development, its ripple effects were also evaluated.
 - v) The outlook for independent development
 - vi) The project's independence was examined with reference to its operation, management, economy, finances, skills and other aspects, and its sustainability was gauged and confirmed. In addition, a "Cooperation Target Attainment Table" was prepared in the course of the project as a form of self-evaluation. The joint survey team used this table as the basis of the field survey.
- b) Joint evaluation

During the field survey, all members cooperated in preparing minutes for the discussed results, based on the performance matrix and other factors. The performance matrix is appended to the minutes. The Indonesian side was responsible for recording the minutes.

This is a task they should perform as part of their independent development and they positively recognized it as such. The performance matrix was divided into counterpart and farmer levels in line with the points of the TSI. Each point was marked A, B or C according to how well the target had been attained, and a brief comment was added to each. This produced a document summarizing the state of progress in the project as a whole.

This method used in this survey of the effects of the project was to evaluate and record the degree of target attainment for each area of activity within the project. The field survey visited seven of the eight villages to examine related facilities and talk to the people involved. There were time constraints, but the team made their best efforts to hear from as many farmers as possible.

(4) Summary and Suggestions for Each Field

a) Specific Points to Consider in Connection with the Evaluation

i) Planning of comprehensive agricultural and rural development

- What is the impact of farmers' participation in this project?
- The position of the six types of development plan in the eight target villages.
- Planning for the effective use of land, water and human resources.
- The handling of meteorological measurement data.
- The suitability of each type of farming plan.

ii) Agricultural and rural infrastructure improvement

- The outlook for Onewila village, which appears likely to be left out of the project.
- The handling of wasteland in land improvement.
- Degree of understanding of surveying (plane table, level, reference points and the preparation of contour maps).
- Degree of understanding of design, estimation and construction (structural design, ????, quality control, construction management and process management).
- Methods for the development of alang-alang grassland.
- Maintenance management of agricultural infrastructure.
- Systems for the management and maintenance of heavy equipment and agricultural machinery.
- Degree of technical transfer to heavy equipment operators.

- State of machinery maintenance in each village.
 - Method of response by counterparts when a breakdown occurs.
 - Methods for the sustainable use of agricultural machinery (stock funds etc.).
- iii) Demonstration of cultivation and farming techniques
- The current rate of self sufficiency in Indonesia's rice supply.
 - State of preparation of technical manuals.
 - State of Water Users' Associations (P3As).
 - State of programs to support farmers' organizations.
 - The handling of traditional Gotong-royong (the mutual assistance system).
 - Handling of differences in farming forms between Tolaki, Bugi and other ethnic groups.
 - Handling of model and trial fields.
- iv) Strengthening of farmers' organizations
- Nature of the revolving system operated by Ministry of Agriculture program.
 - State of each farmers' organization.
 - Independence of farmers' organizations after the end of the project.
 - Propagation of project effects to students of technical high schools.
 - Real state of farmers' organizations and side trades.
 - Agricultural fairs and the stimulation of villages.
- v) Government-related agencies etc., key farmers and group training
- Content of training and methods of trainee selection.
 - Training programs with an eye on the future.
- vi) Miscellaneous
- Is this project "aid with a human face"?
 - Division of budgetary burden between central and provincial governments.
 - The state of counterpart posting.
 - Tasks the Indonesian side must tackle after the end of the project.
 - Prolongation and the outlook for specialist fields which will require it.
- b) Integrated Agricultural and Rural Development Plan/ Agricultural and Rural Infrastructure

Development

i) Summary

This project is characterized by its use of farmers' participation, with a portion of the Indonesian side's local costs for the necessary land improvement, construction machinery etc. being substituted by the provision of model infrastructure improvements and the provision of equipment and materials in order to move the project forward smoothly. In particular, it is important to understand what is meant by "agricultural and rural improvements through farmers' participation", and this point is given close consideration in this final evaluation. The elements of this project which are evaluated as being well managed are analyzed below.

- 1) This was "aid with a human face" in which discussions and coordination with the local farmers began from the start of the project plan and the project proceeded with their agreement.
- 2) One form of participation was the way farmers provided their labor for the excavation of irrigation canals. The counterparts were central to this process, which gave the farmers a sense of ownership of the facilities.
- 3) Agricultural and rural facilities which genuinely met the needs of the villages, such as rice polishing stations, shared wells, cattle fattening centers, drying facilities and seed stores, were constructed with the wholehearted participation of the farmers. This raises the farmers' sense of involvement in the building of the villages concerned, and persuaded them that these facilities should be maintained and managed by farmers' organizations.
- 4) The creation of stock funds and the collection of fees for the use of rice polishing stations by Water Users' Associations is highly desirable as a means of preparing funds for the maintenance management and replacement of facilities in the future. These measures are steps towards the independent development of the Water Users' Associations.
- 5) Effective development methods have been established for the use of heavy equipment in the development of alang-alang grassland and the preparation of paddy fields in wetland areas. Operation skills are being transferred to inexperienced operators selected from among the farmers.
- 6) The development concept of this project has been taken as the model for other projects developing in Southeast Sulawesi Province. These include projects financed by the World Bank and joint projects for integrated agricultural development funded by the Ministry of Agriculture from its own budget.

ii) Suggestions

- 1) The ripple effects of this project are starting to encourage nearby farmers to build their own paddies and dry fields. Development methods for such situations should be devised, which take into account the limitations on water, land and human resources.
- 2) One problem of these developments is that they go beyond those directed at food within the range enabled by the available human resources, raising the problem of unrestrained development motivated only by the availability of land. A development plan must be put forward which makes rational use of the land, water and human resources available in the area.
- 3) Further technical transfer is required for quality and construction management for concrete and earthworks.
- 4) The maintenance management of equipment could face increasingly common breakdowns. The check system developed for this project must be used in suitable operation management.
- 5) In the cause of independent development, the provincial government should take a central role in project operation with support from central government-related agencies. The "Kendari District Office for Integrated Agricultural and Rural Development" should be enhanced to take on this role.
- 6) Shallow shared wells which are around 5m deep run the risk of pollution from the permeation of residual fertilizers and agricultural chemicals used in farming. These wells should be improved to allow their safe and sustainable use.

c) Construction Management

i) Summary

- 1) Construction are preceded by explanatory presentation meetings organized around the project counterparts to produce the implementation plans.
- 2) The construction of agricultural infrastructure can follow one of three methods: contracting, direct management and farmers' participation. These methods will transfer construction management skills to the counterparts and the people concerned in provincial government.
- 3) Quality control of constructed paddy fields was achieved using plane tables for surveying, and the relevant skills were transferred. The use of photogrammetry to survey completed works is a new approach in this country, and the Indonesian side gained a full understanding of the efficacy of the technique through the project.
- 4) Local explanatory meetings were held in each village even for directly managed construction works, particularly farm roads. These farm roads are also the roads the

villagers use in their daily lives, so their opinions were heard and incorporated before the construction began.

- 5) Ponds were constructed as a valuable source of irrigation water for the dry season, so their locations were selected with great care.
- 6) The wages for farmers' groups providing construction labor were paid to the groups. Some 25-35% of these payments were appropriated to add to funds earmarked for future maintenance management and other organized farmers' activities. This practice led to the successful operation of these groups and their facilities.
- 7) The construction works for land improvement were contracted out, giving the counterparts a full understanding of the importance of construction procedures and the handling of topsoil. The effective application of heavy equipment methods for eliminating alang-alang grass without the use of herbicides is a notable and valuable technique appropriate to the area.

i) Suggestions

- 1) Further technical transfer is required in connection with the judgement of site conditions, including complex technical specifications, slopes and soil properties, and for estimation based on calculations of soil haul distance etc.
- 2) The counterparts are now able to perform for themselves construction management tasks such as the preparation of implementation plans for simple facilities and earthworks etc. Further technical transfer is needed to enable them to handle the full range of construction management, including planning the implementation of advanced and complex works, estimation of construction costs and the direction of heavy equipment operation.
- 3) Technical transfer is necessary for the basic elements of the quality control of concrete works related to land improvement, the rolled compaction of farm roads and other construction management skills.
- 4) The developed methods of farmers' participation and the transferred techniques for eliminating alang-alang grass can be propagated for application in other developable areas, so they should be promoted further with the aid of the provincial government and other related agencies.
- 5) The inconvenience of communications caused by the isolation of the project office from the sites should be alleviated.

d) The Operation and Maintenance Management of Machinery

i) Summary

- 1) The construction skills of the operators of heavy construction equipment are gradually improving through technical guidance and training. A system for the maintenance management of heavy equipment is also being set up.
- 2) Technical guidance is given for the operation and repair of farm machinery such as rice polishers and hand tractors and many farmers have acquired these key skills.
- 3) Operation records and checklists are provided for the maintenance management of machinery, so that the office can keep track of the condition of the machinery in each village. There are also mobile two ton trucks which have been modified and equipped with the necessary equipment and materials to serve as mobile repair shops. The equipment is ready for the farmers to make repairs on their own equipment in the future.

ii) Suggestions

- 1) The farmers' skills in the operation and management are still at the early stages and many breakdowns still occur in the field. Training and guidance in day-to-day operation are required to raise farmers' skills to the level where they can diagnose problems.
- 2) Model villages which are far away from Kendari city lack workshops or other facilities to make repairs. The village level maintenance management system must be strengthened to at least the level of that in Ranometo. In comparison with Ranometo, the skills and gifts of the farmers in other villages are at a much lower level. Technical guidance for these farmers will need to carry on for a long time.

e) Demonstration of farming and cultivation techniques

i) Summary

- 1) The unit yield of rice crops has been around 1t/ha. Improved farming techniques could raise this to 3~5t/ha. Most notably, it has been proven that two crops per year is a possibility.
- 2) The locations of model fields were selected appropriately so that they fulfill their demonstration purposes. The area converted to cash crops nearby is expanding.
- 3) Upland paddy rice is the staple food of indigenous peoples who are a majority in the project area, and they also use it for religious events. Improved techniques for the cultivation of upland paddy rice is essential if development is to be fairly balanced between the various peoples and regions of the project area, so this crop has been

incorporated into the scope of technical assistance.

ii) Suggestions

- 1) So far, the demonstration of techniques has been under the direct guidance of the experts, but for independent development in the future, this work should be handled by advanced educational field workers
- 2) Counterparts prepare manuals for proven techniques under the guidance of the experts. However, no sufficient proof has been conducted for transplanted paddy rice or for upland paddy rice and the guidance of experts should continue until these tasks are completed.

D) Reinforcement of farmers' organizations

i) Summary

- 1) The survey of farmers' organizations gathered basic data on factors such as ethnicity, culture and land ownership. This survey was extremely valuable for the direction and progress of the project.
- 2) Before the project began the only farmers' organization was in Ranometo and that was largely dormant. Since the start of cooperation, associations have been formed for water management, rice polishing station users, machinery users and others as the relevant facilities have been built.
- 3) Projects to support organized activities have included chicken rearing, market gardening and vegetable cultivation for women's and young people's groups. These projects have succeeded in motivating the groups to work together in planning and implementing group activities and enhanced their abilities. They have also improved nutrition and increased cash income.

ii) Suggestions

- 1) When future projects of this type are implemented, the basic survey of the farmers should be conducted at the earliest possible stage out of consideration of its effects on specific activities within the project.
- 2) Current farmers' organizations exist independently with one for each function. In place of these, the Indonesian side should establish KUDs which can exercise integrated management functions.
- 3) As farmers' organizations develop independently, their stock funds will become their economic base, so methods for the stable continuation of these funds should be studied.
- 4) In future, guidance should be focused on technical transfer at the level of educational

field workers, and particularly on counseling activities. Furthermore, all report documents should be translated into Indonesian and working manuals should be completed to assist in improving organizations.

(5) The Outlook for Independent Development

In this section, the Indonesian side of the survey team has examined issues which should be considered by the Indonesian side, and prepared the draft minutes of these deliberations. Important portions of these minutes are included here in summary.

a) The Outlook for Independent Organizational Development

A wide variety of agencies have pursued diverse activities towards the attainment of this project's goals, achieving considerable success. However, if this work is to continue and spread further after the end of the project, those concerned have to be aware that great efforts will be required. These efforts will be the task of the Indonesian government. Therefore the government must establish the organizational structures necessary for the continuation of this project. This will require coordination between the agencies involved, and a firmly established role for the counterparts, who have gained transferred skills. Even if the establishment of such an organization is impossible, the various agencies will still be capable of a wide range of activities.

However, strong cooperation between agencies will still be required. The regional government is the ideal organization to lead the strengthening of cooperative inter-agency links. This is in line with government guidelines calling for greater regional devolution of powers.

The solutions for the kind of independent development described above must be prepared during the R/D period.

b) The Outlook for Independent Financial Development

The Sixth National Development Plan included four central projects in the agricultural sector. Elements of these projects are modeled on this project and other parts are very similar in content. Therefore even after the Japanese cooperation with this project ends, it can continue to be developed using elements of the plans for these central projects. Even the parts of these plans which are not suitable for application to this project could be developed using the local government budget, foreign loans or bank loans.

(Note: World Bank projects modeled on this project are scheduled to begin in nearby areas.)

The stock fund system, established as part of the activities of the farmers' organizations

set up within the project, merits close attention as a way of recovering costs using independent financial resources. This system of shared investment by farmers can be expected to fund the purchase of materials, infrastructure improvements, the maintenance management of machinery and other applications.

(Note: Some of these funds currently hold portions of the wages paid for farmers' participation in infrastructure improvements and others use fees from the use of agricultural machinery and rice polishing stations).

c) **The Outlook for Independent Physical and Technical Development**

Technical cooperation has transferred skills to the counterparts and in some parts of the project's work the counterparts are taking the lead. During the R/D period it is an essential condition for the attainment of the project's objectives that most of the counterparts who have acquired transferred skills remain rooted in the project.

One aim of this project was that it should not end with the transfer of skills to the counterparts, but rather that the skills would be of direct benefit to the farmers. That was the purpose of the training of counterparts. Some of the counterparts have no more than a shallow knowledge of their assigned specialist fields. Considering the wide range of subjects they must give guidance in, further guidance will be required for some time to come.

The establishment of the kinds of organizational measures described above is a precondition for the training of successors to the counterparts. The role of the local government is important in this regard.

(6) **The Necessity of Follow-up**

This point is dealt with in more detail in section 3.7 below, but an extension of one year in the cooperation period will be required. After that, the need for ongoing follow-up in some fields should be considered, particularly in the "soft" aspects of the project. The extension is needed because the investment and activities initially scheduled for the eight model villages have not been completed.

The need for additional follow-up in certain fields can be foreseen because the cooperation period, including the extension, is the minimum period needed to complete one pass through all of the project's scheduled activity. It will not necessarily be long enough to realize the full effects. This is particularly likely in the fields where the main activity, centered on "soft" aspects, occurs after the land improvement stage.

The joint survey group indicated in the minutes whether or not follow-up would be

required.

(7) Summary of Evaluation Findings

a) Summary of the Evaluation

This project was a participatory comprehensive agricultural and rural development project in which the farmers are encouraged to participate in the building and improvement of their own villages. The facilities which have been built are maintained and managed by the farmers' own organizations. The recognition of these necessities is a revolution in perception of development.

The main factors behind this project's steady progress and production of results are as follows.

- i) The content of all plans was explained to the local farmers from the initial planning stage, and their agreement was gained before plans were adopted. Their awareness of participation was raised from the planning stage onwards.
- ii) At the implementation stage, one way the farmers participated was by providing their labor, under the guidance of project experts, for the construction of roads and water canals. The counterparts were central in this process. This process was taken as the opportunity to establish stock funds intended to cover the costs of maintenance management and eventual replacement of the facilities. This method also gives the farmers a stronger sense of ownership of the facilities.
- iii) As well as the production infrastructure, all other agricultural and rural facilities (such as rice polishing stations, fattening yards, seed stores, drying facilities, training facilities and shared wells) were constructed with the prior agreement of the farmers.
- iv) For the independent development of this project after its completion, the provincial government must set up an organization for its management. This organization will become the leading agency, which will work together with the central government (the local offices of the Ministries of Agriculture, Public Works and the Interior) to enhance and develop the project.
- v) The R/D deadline for this project is 29th February 1996, but this is likely to be delayed until around December 1996 due to the weather and other factors. Therefore the R/D will have to be simply extended by one year. In addition to bringing the construction to a satisfactory completion, a management system (for the management of facilities and machinery, water management and the stable continuation of the stock funds) must be established for farmers' organizations to run the project after the end of Japanese

assistance. A farming system will also be required. After the end of the extension period, follow-up will still be required, covering only the "soft" aspects of the establishment of management and farming systems by the farmers' organizations.

b) Suggestions

The following is a draft translation of suggestions made by the joint survey team.

i) Development of management techniques which are acceptable to the farmers

Ordinarily, technical transfer targets the counterparts as the first step. In this project, technical transfer direct to the farmers is necessary for the maintenance management of agricultural and rural facilities such as roads and irrigation channels which were constructed through the farmers' participation. Therefore, from the point of view of independent development after the end of Japanese assistance, it is extremely important to devise management techniques, including farming guidance, which are acceptable to the farmers. The farmers must also receive continuing training to enhance their command of these techniques.

ii) The project's future (potential for independent development)

If the project is to be capable of independent development in the future, it must have high-quality staff and a budget at least sufficient to cover the costs of the materials now supplied by Japan.

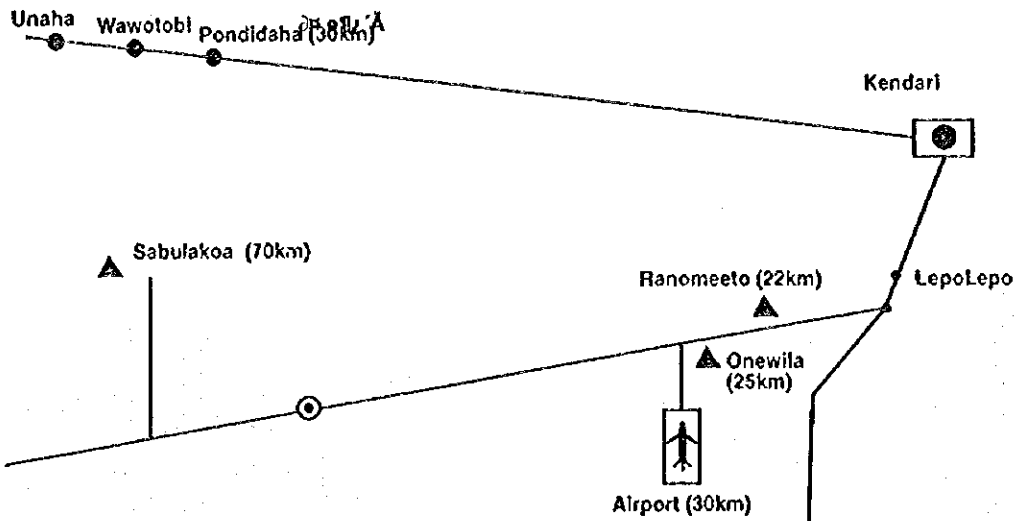
Furthermore, after the end of Japanese assistance, some kind of agency should be set up within BAPPEDA and the other provincial governmental agencies to carry on the project. This agency should, of course, work with the assistance of the Ministries of Agriculture, Public Works and the Interior and other related agencies.

iii) The necessity of Japanese assistance in the future

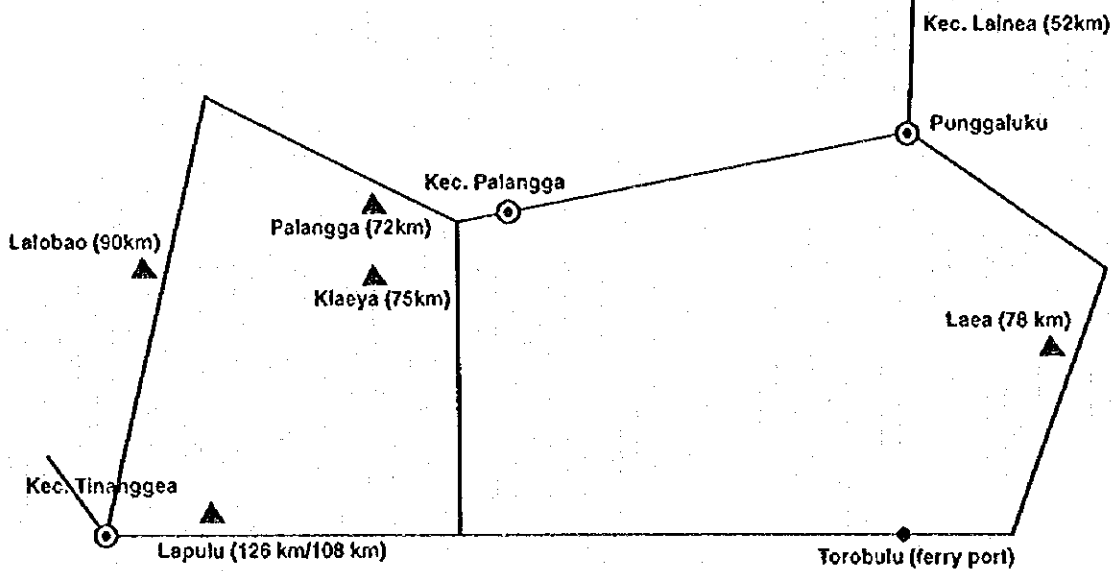
According to the record of deliberations (R/D) signed on 26th January 1991, this project was to end on 29th February 1996, but the fact that the work of land reclamation can only proceed in the dry season, and other problems, delayed the completion of agricultural facilities, probably until December 1996. Further work is still needed to devise management techniques which are acceptable to the farmers. Therefore the joint survey team suggests that the Japanese assistance for this project be extended and full follow-up provided.

The joint survey team suggests one year as a suitable extension period, but further assistance should be considered later in the light of progress in the strengthening of farmers' organizations, particularly for water management, in the development of cultivation and farming techniques, and in other work stipulated in the TSI.

6. Drawings



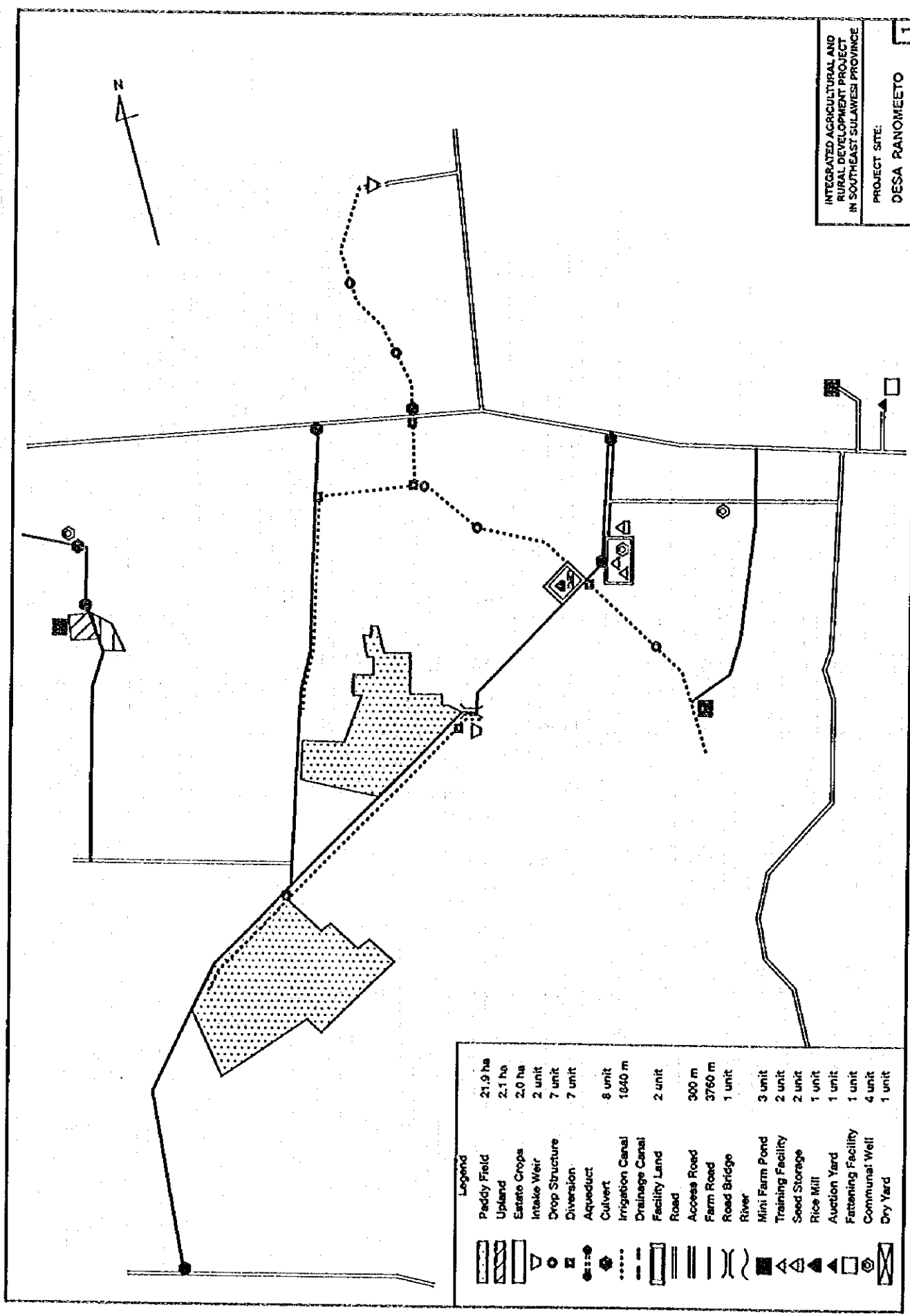
Office to a site		Distance	Time
1. kendari	Ranomeeto	22 km	25 min
2. kendari	Onewila	25 km	25 min
3. kendari	Sabulakoa	70 km	1.5-2hr
4. kendari	Palangga	72 km	1.5 hr
5. kendari	Klaeya	75 km	1.5 hr
6. kendari	Lalobao	90 km	2.0 hr
7. kendari	Lapulu	126 km	2.75 hr
8. kendari	Laea	78 km	1.75 hr



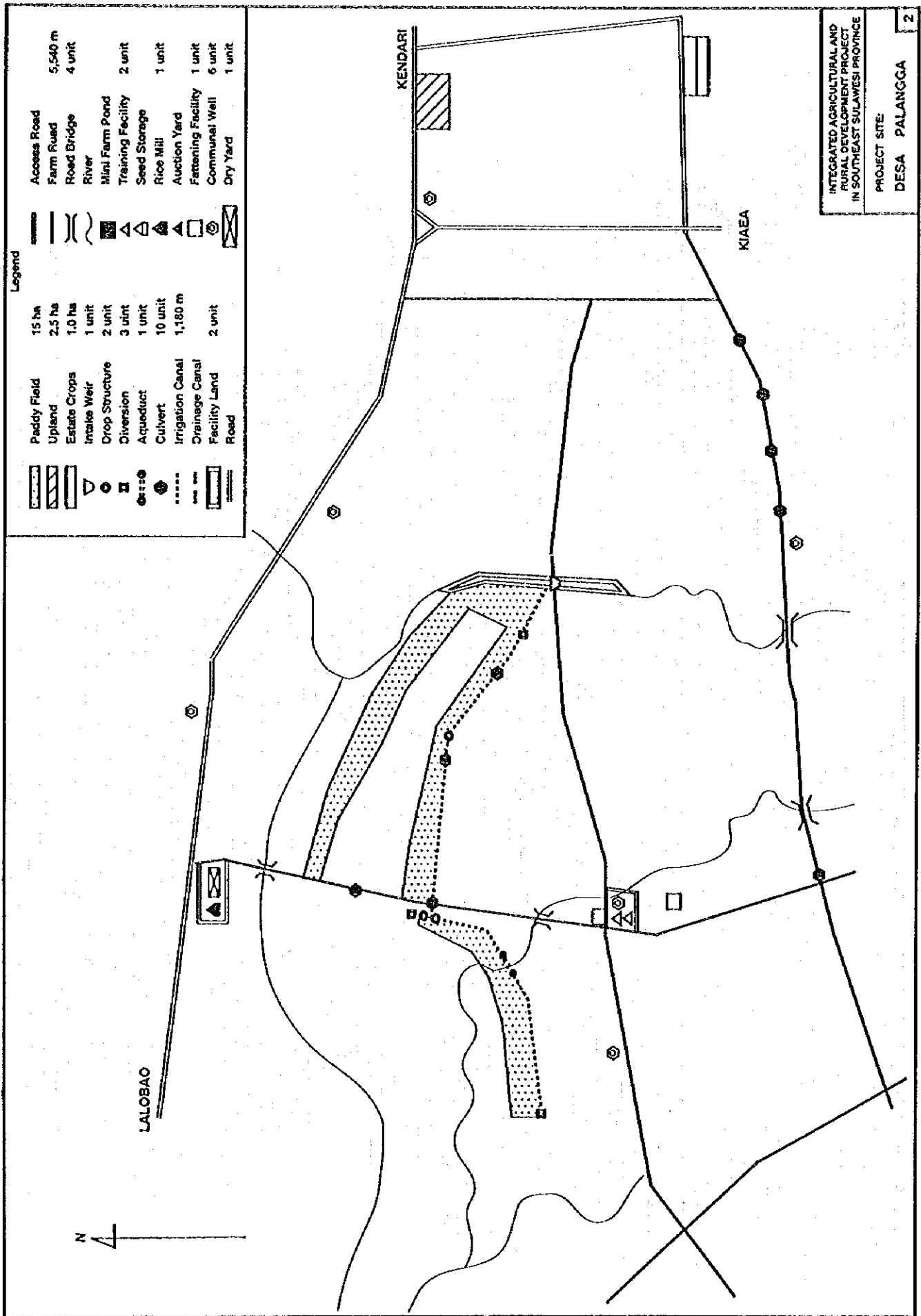
Location of Project Sites

MAP OF THE PROJECT SITE

No.	SITE NAME
1	Desa Ranomeeto Project Site
2	Desa Palangga Project Site
3	Desa Kiaea Project Site
4	Desa Lapulu Project Site
5	Desa Lalobao Project Site
6	Desa Laeya Project Site
7	Desa Sabulakoa Project Site
8	Desa Onewila Project Site



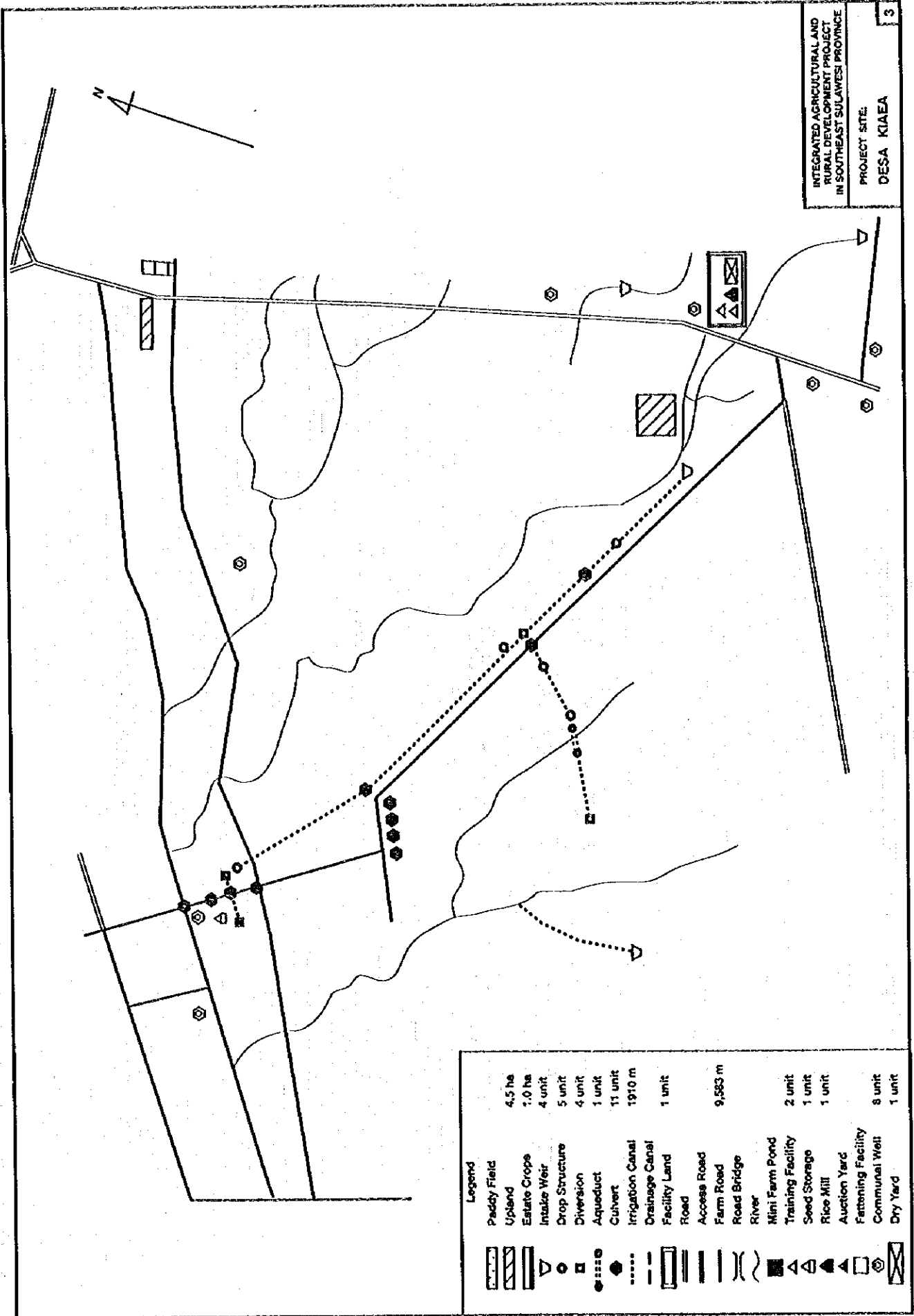
Legend	
	Paddy Field 21.9 ha
	Upland 2.1 ha
	Estate Crops 2.0 ha
	Intake Weir 2 unit
	Drop Structure 7 unit
	Diversion 7 unit
	Aqueduct 8 unit
	Culvert 1940 m
	Irrigation Canal
	Drainage Canal
	Facility Land 2 unit
	Road
	Access Road 300 m
	Farm Road 3760 m
	Road Bridge 1 unit
	River
	Mini Farm Pond 3 unit
	Training Facility 2 unit
	Seed Storage 2 unit
	Rice Mill 1 unit
	Auction Yard 1 unit
	Fattening Facility 1 unit
	Communal Well 4 unit
	Dry Yard 1 unit



INTEGRATED AGRICULTURAL AND
RURAL DEVELOPMENT PROJECT
IN SOUTHEAST SULAWESI PROVINCE

PROJECT SITE:
DESA PALANGGA

2

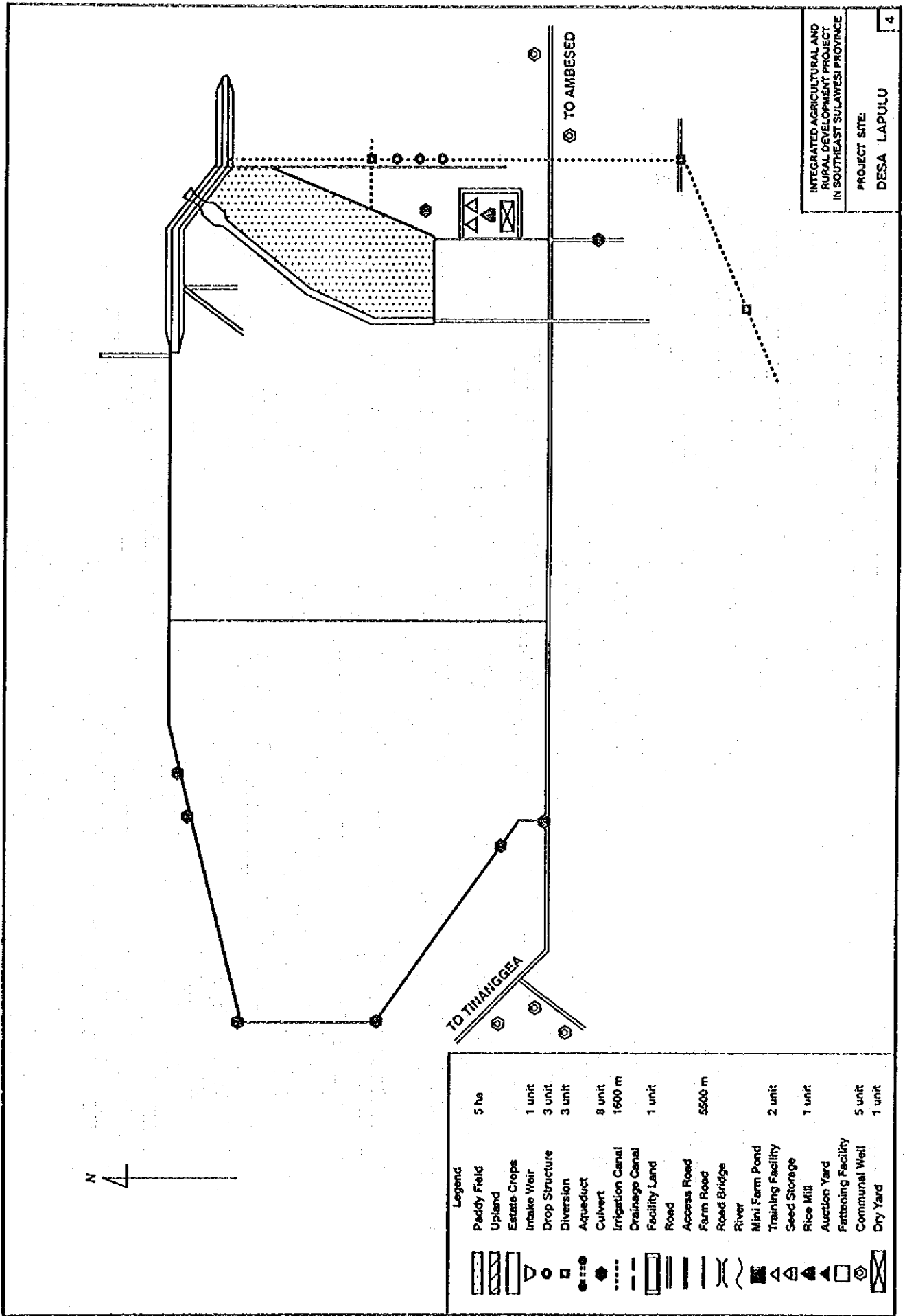


INTEGRATED AGRICULTURAL AND
RURAL DEVELOPMENT PROJECT
IN SOUTHEAST SULAWESI PROVINCE

PROJECT SITE:
DESA KIAEA

3

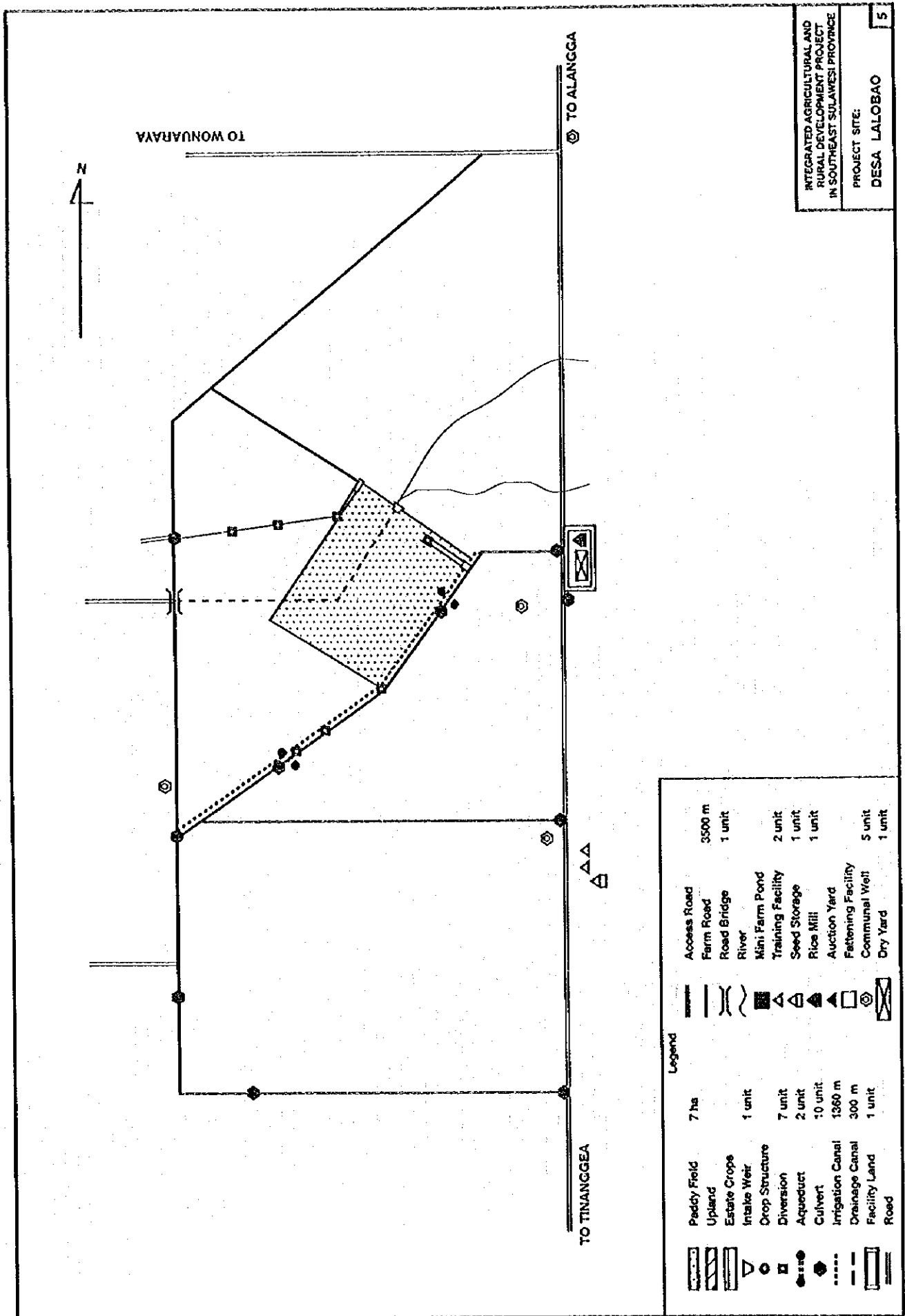
Legend	
	Paddy Field
	Upland
	Estate Crops
	Intake Weir
	Drop Structure
	Diversion
	Aqueduct
	Culvert
	Irrigation Canal
	Drainage Canal
	Facility Land
	Road
	Access Road
	Farm Road
	Road Bridge
	River
	Mini Farm Pond
	Training Facility
	Seed Storage
	Rice Mill
	Auction Yard
	Fattening Facility
	Communal Well
	Dry Yard

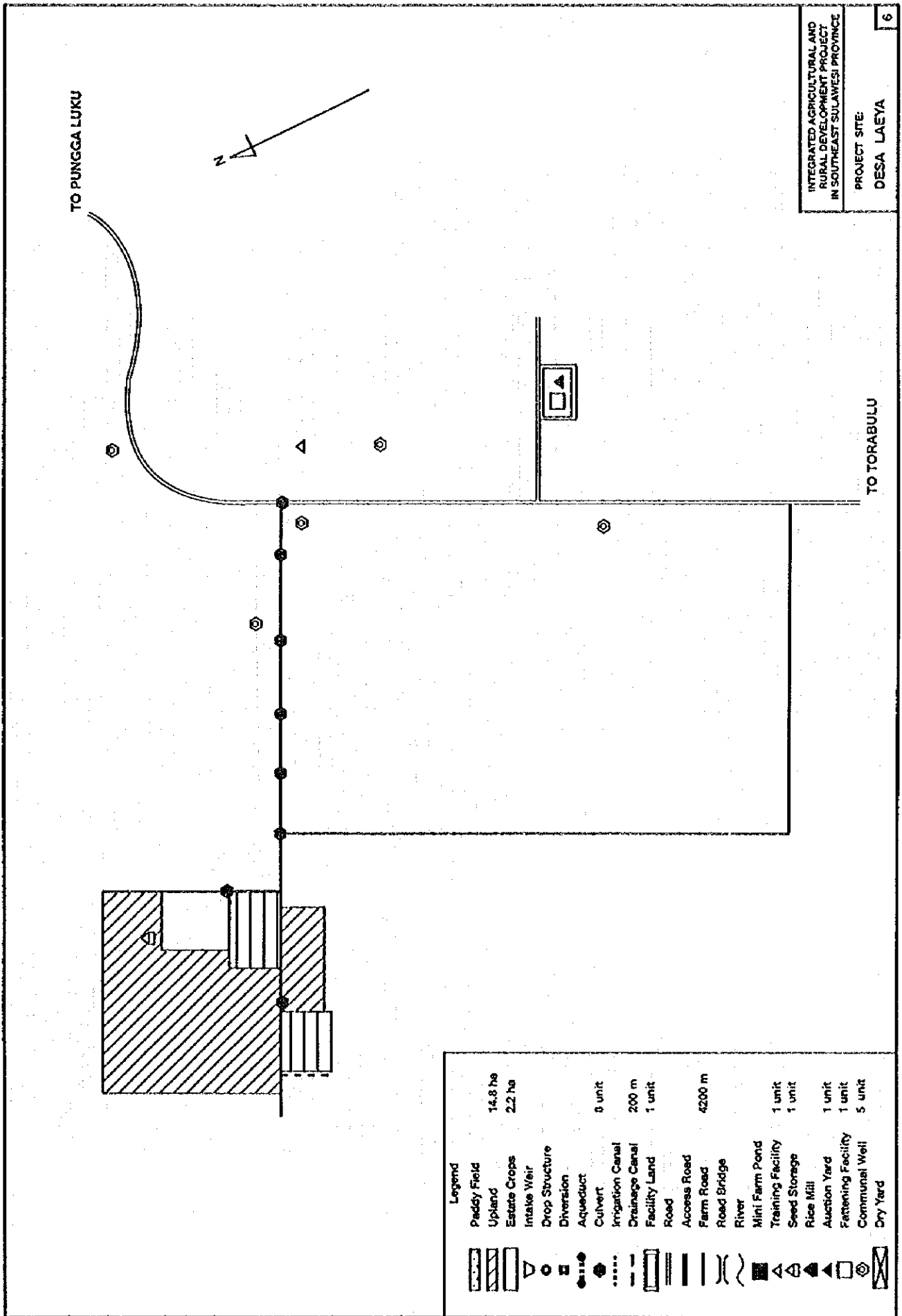


INTEGRATED AGRICULTURAL AND
RURAL DEVELOPMENT PROJECT
IN SOUTHEAST SULAWESI PROVINCE

PROJECT SITE:
DESA LAPULU

Legend			
	Paddy Field	5 ha	
	Upland		
	Estate Crops	1 unit	
	Intake Weir	3 unit	
	Drop Structure	3 unit	
	Diversion	8 unit	
	Aqueduct	1600 m	
	Culvert		
	Irrigation Canal		
	Drainage Canal		
	Facility Land	1 unit	
	Road		
	Access Road	5500 m	
	Farm Road		
	Road Bridge		
	River		
	Mini Farm Pond	2 unit	
	Training Facility		
	Seed Storage	1 unit	
	Rice Mill		
	Auction Yard		
	Fattening Facility		
	Communal Well	5 unit	
	Dry Yard	1 unit	



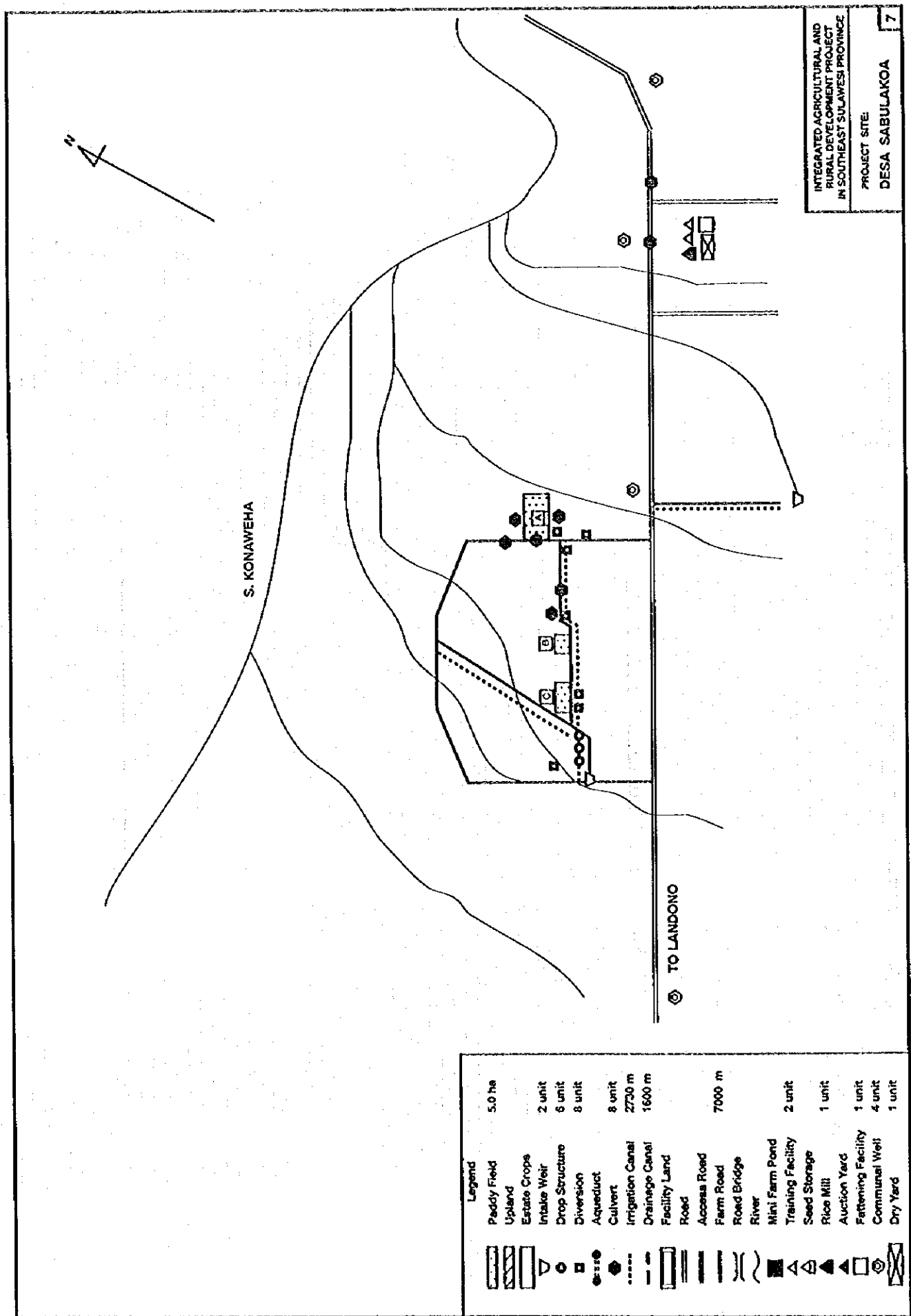


INTEGRATED AGRICULTURAL AND
RURAL DEVELOPMENT PROJECT
IN SOUTHEAST SULAWESI PROVINCE

PROJECT SITE:
DESA LAEYA

6

Legend	
	Paddy Field 14.8 ha
	Upland Estate Crops 2.2 ha
	Intake Weir
	Drop Structure
	Diversion
	Aqueduct 3 unit
	Culvert
	Irrigation Canal 200 m
	Drainage Canal 1 unit
	Facility Land
	Road 4200 m
	Access Road
	Farm Road
	Road Bridge
	River
	Mini Farm Pond 1 unit
	Training Facility 1 unit
	Seed Storage
	Rice Mill
	Auction Yard 1 unit
	Fattening Facility 1 unit
	Communal Well 5 unit
	Dry Yard

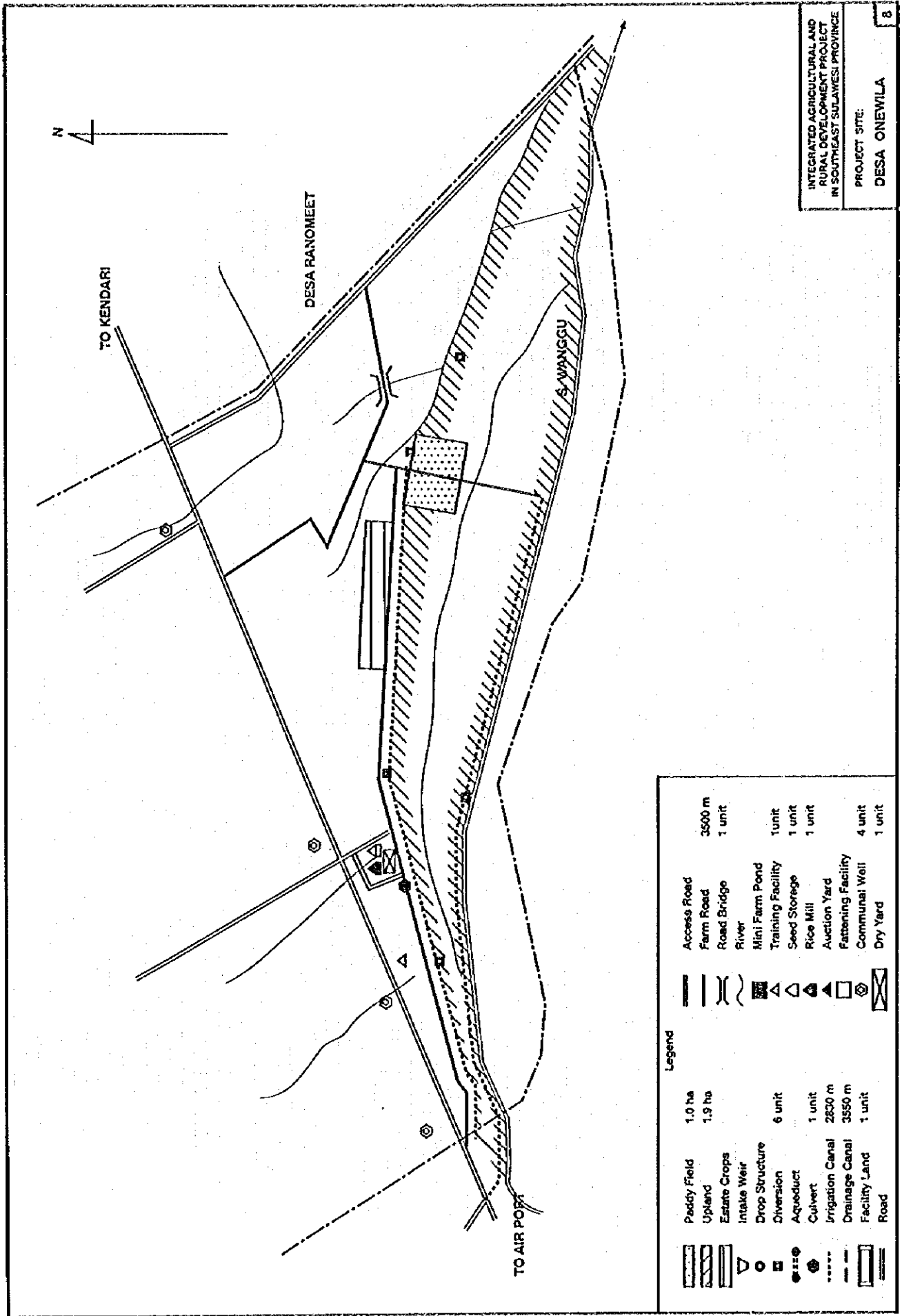


S. KONAWEHA

TO LANDONO

INTEGRATED AGRICULTURAL AND RURAL DEVELOPMENT PROJECT IN SOUTHEAST SULAWESI PROVINCE
PROJECT SITE: DESA SABULAKOA 7

Legend	
	5.0 ha
	2 unit
	6 unit
	8 unit
	8 unit
	2730 m
	1600 m
	7000 m
	2 unit
	1 unit
	1 unit
	1 unit
	4 unit
	1 unit
	1 unit



INTEGRATED AGRICULTURAL AND RURAL DEVELOPMENT PROJECT
 IN SOUTHEAST SULAWESI PROVINCE
 PROJECT SITE:
 DESA ONEWILLA

Legend

	Paddy Field	1.0 ha		Access Road	3500 m
	Upland	1.9 ha		Farm Road	1 unit
	Estate Crops			Road Bridge	
	Intake Weir			River	
	Drop Structure	6 unit		Mini Farm Pond	
	Diversion			Training Facility	Tunit
	Aqueduct			Seed Storage	1 unit
	Culvert	1 unit		Rice Mill	1 unit
	Irrigation Canal	2830 m		Auction Yard	
	Drainage Canal	3550 m		Fattening Facility	
	Facility Land	1 unit		Communal Well	4 unit
	Road			Dry Yard	1 unit

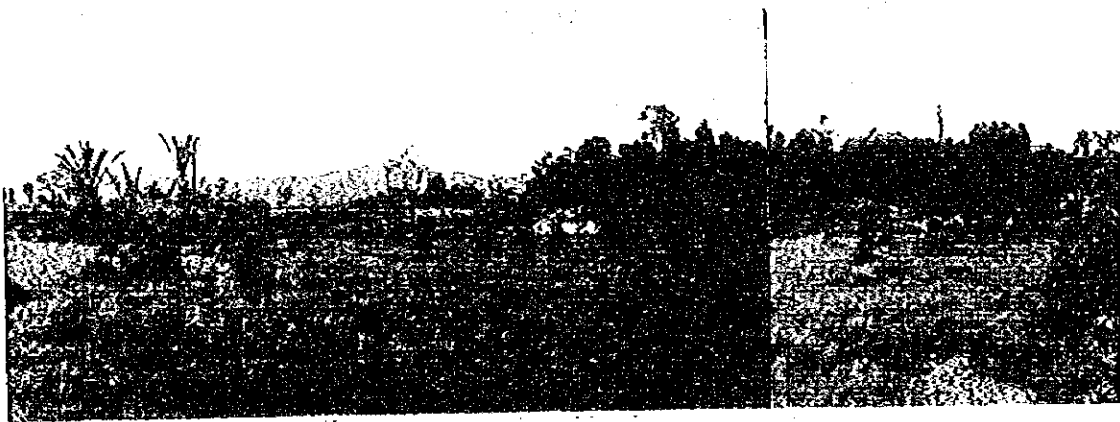
7. *Documentary Photographs*



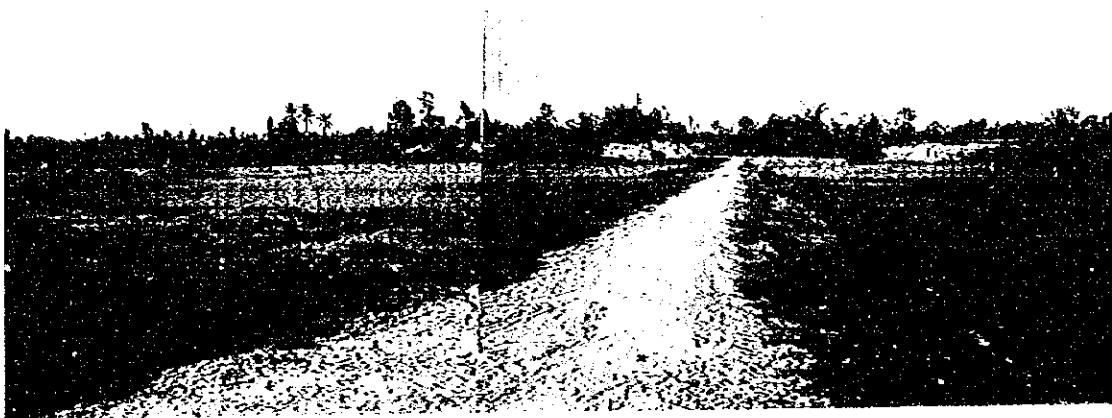
**Integrated Agricultural and Rural Development Project
Office(Front view)**



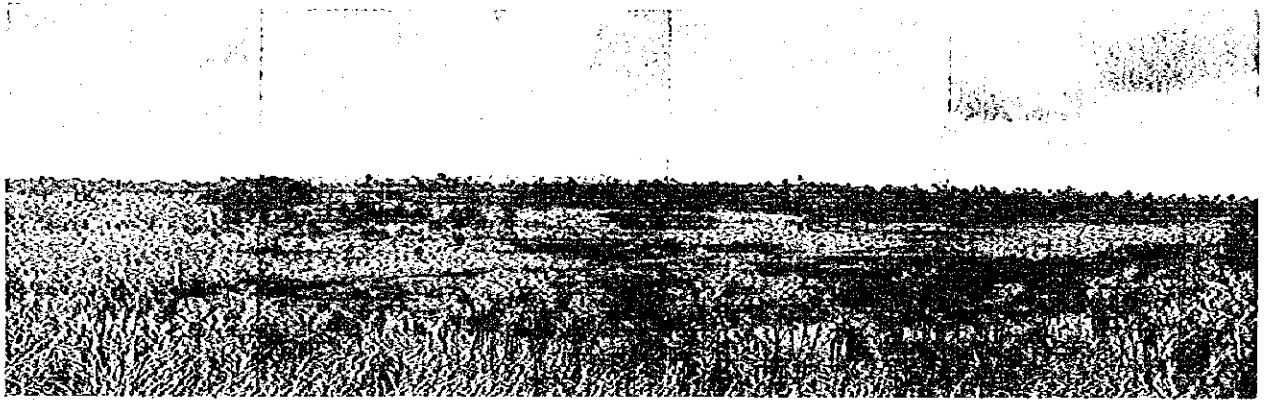
Base camp office in Palanga



Proposed area for paddy field development in Onewila (Mar. 1995)



After completion of paddy field development in Onewila (Feb. 1997)



Proposed area for paddy field development in Lalobao (Mar. 1994)



After completion of paddy field development in Lalobao (Dec. 1995)



Proposed area for paddy field development (A block) in Sabulakoa



After completion of paddy field development (A block) in Sabulakoa (Feb. 1997)



Site inspection of proposed development area with beneficiaries



Discussion with beneficiaries on the proposal infrastructure development to obtain farmer's participation (Speaker : Team Leader)



Seminar on agricultural and rural development (Center: Governor of Kendari District, Feb. 1997)



Seminar (Team leader explains the method of development, Feb. 1997)



Technical guidance on home yard horticulture for rural women group in Onewila



Technical guidance on cropping for rural youth in Lalobao



Building of agricultural machinery user's organization in Ranometo



Strengthening of farmer's group; Meeting on effective use of developed farm land in Onewila



Strengthening of water users association; meeting on water management in Lalobao



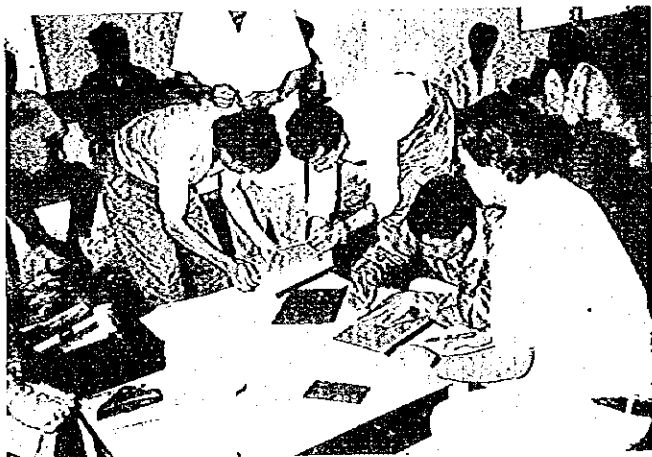
Strengthening of rural women's group; practice of cooking and nutrition improvement in Sabulakoa



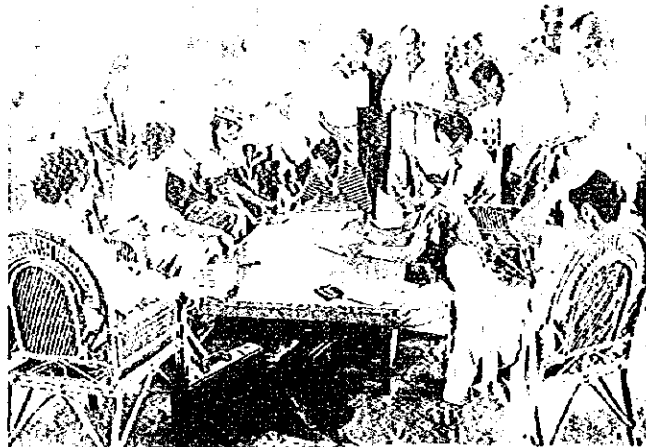
Fry was released by provincial governor into a pond as one of the events of "Farmer's day" in Lapulu



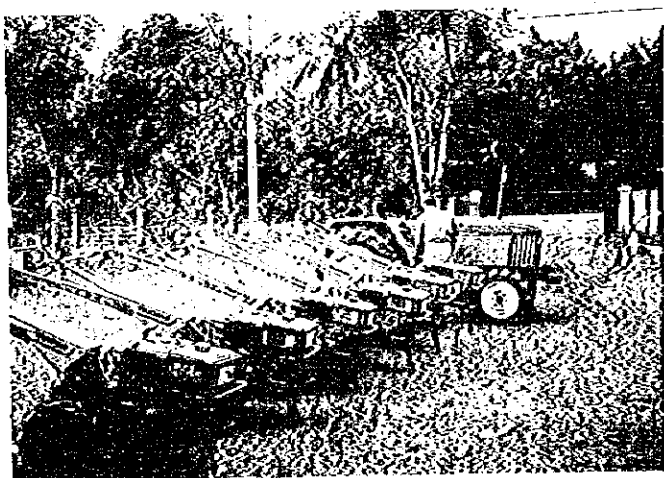
Participants to "Farmer's day" gathering in Lapulu



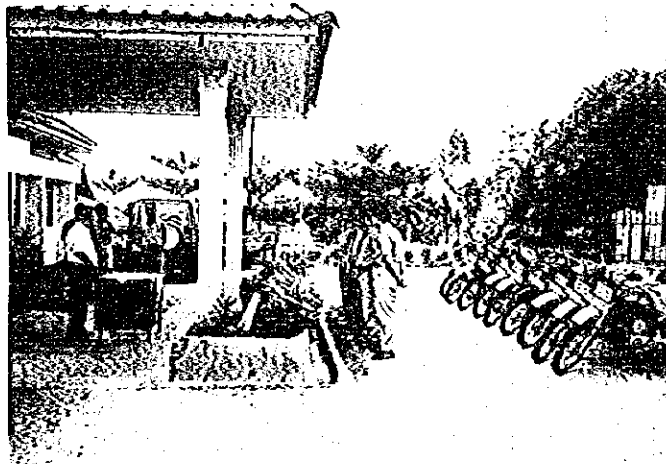
Institutional procedure on the set up of water user's association in Lapulu, under the guidance of C/P



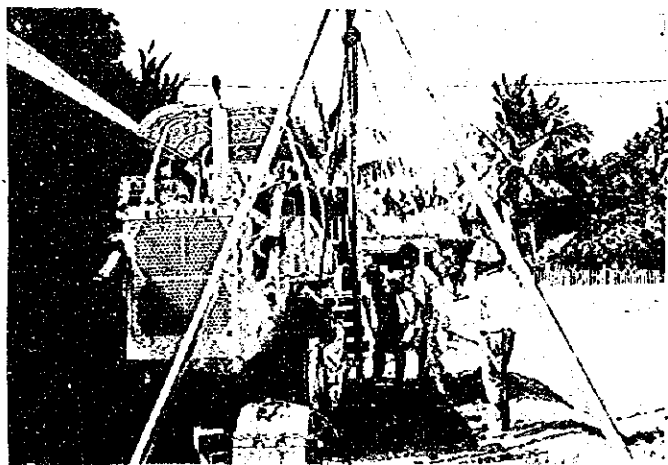
Payment of wages for irrigation canal excavation work done by farmer's group. Some of the wage was saved as "stock fund"



Checking and maintenance of supplied equipment by C/P and operator



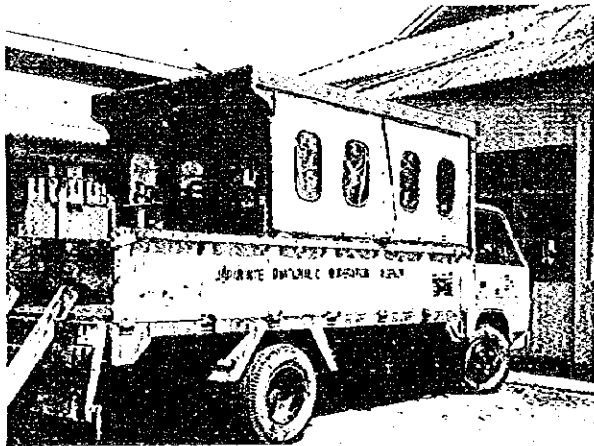
Motor-cycles were lent from the project to extension service works



Reconditioning of lubrication system of bulldozer by operator and mechanic



Replacement of worn out sprocket wheel of caterpillar by C/P, operator and mechanic under guidance of expert



Mobile work shop equipped on 4 ton truck; electric weeding machine, gas equipment, compressor, drill and etc.



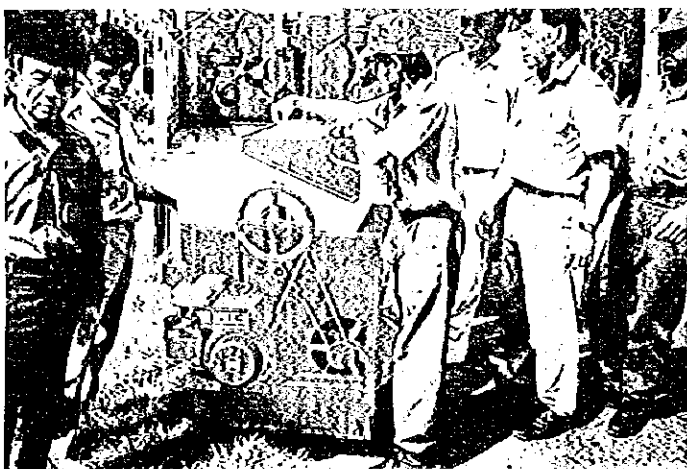
Inside of mobile work shop



Overhauling of hand-tractor engine by rural operator and mechanic under guidance of C/P



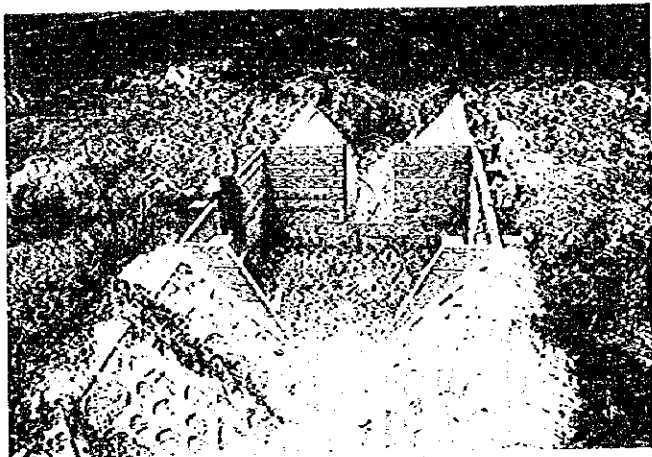
Technical guidance of maintenance of tractor by C/P to rural mechanic



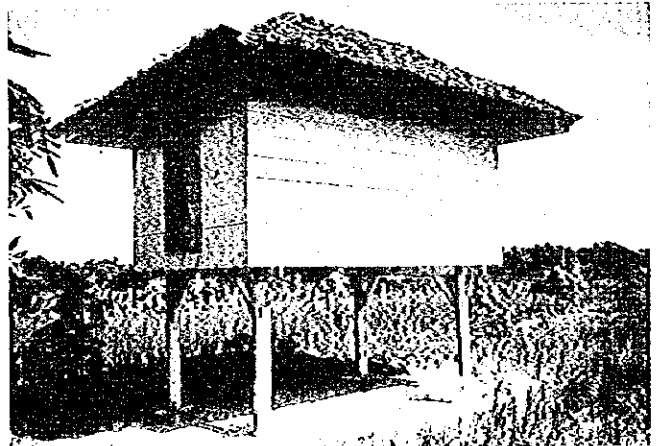
Checking of grain thresher supplied from the project done by C/P, extension worker and key farmer in Onewila



Guidance on the operation of rice mill to rural operator and mechanic



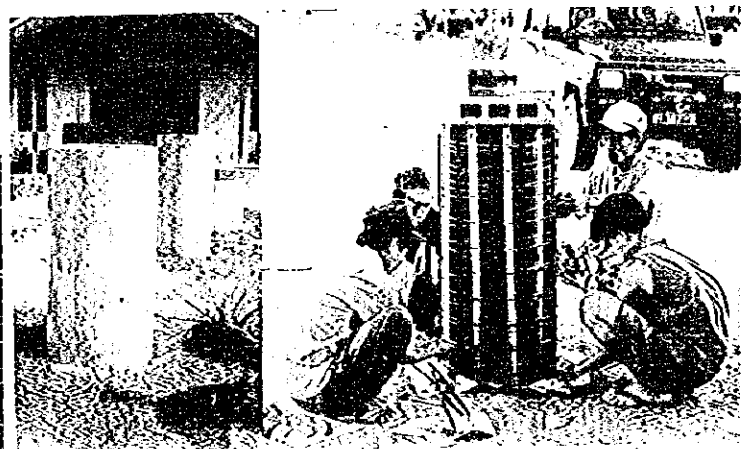
Irrigation water distribution works constructed by locally available materials as to ease the O&M by farmer



Seed storage constructed by locally available materials



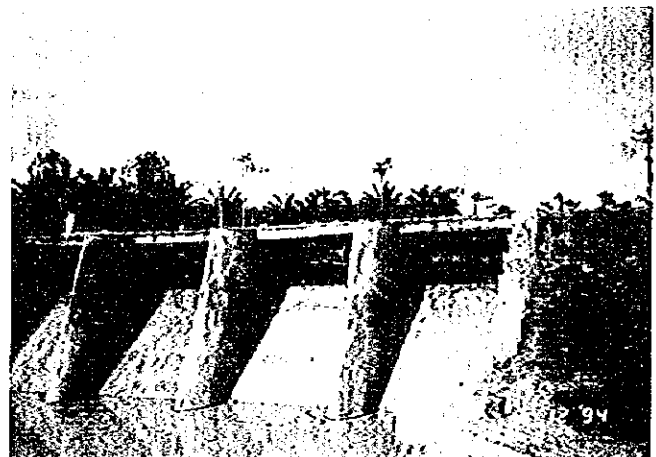
Community well constructed by farmer's group works



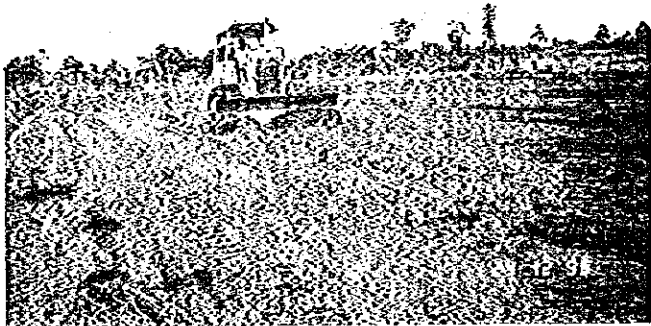
Guidance of manufacturing of reinforced concrete pipe



Tendering of infrastructure development works participated by local constructors at the project office



Completed intake weir under contract works



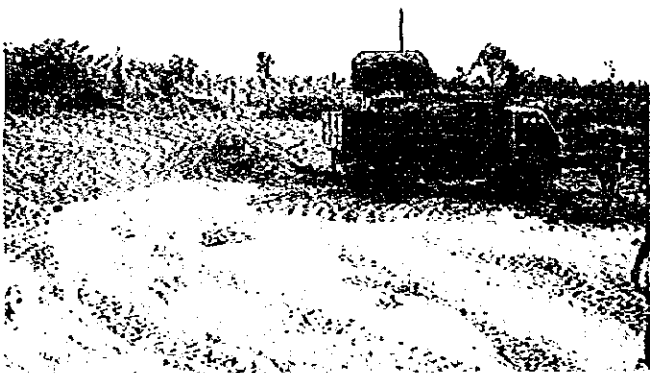
Surface soil Treatment work for paddy field development in Sabulakoa. The thickness of the soil is 5 - 10 cm



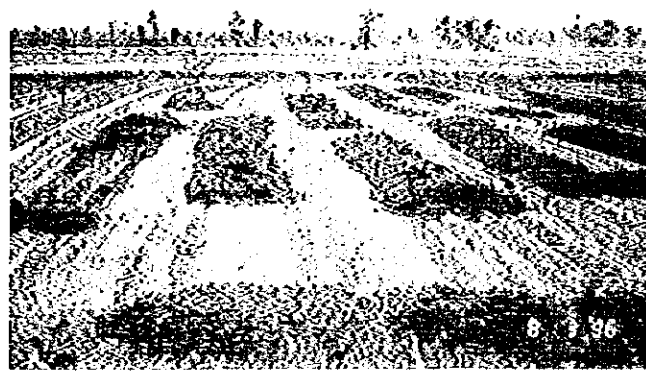
Ploughing by ripper-dozer into 30 cm depth. In Sabulakoa



Completion of ploughing in Sabulakoa



Paddy field construction work in Sabulakoa; soil dressing. Material was collected from Atanalan area.

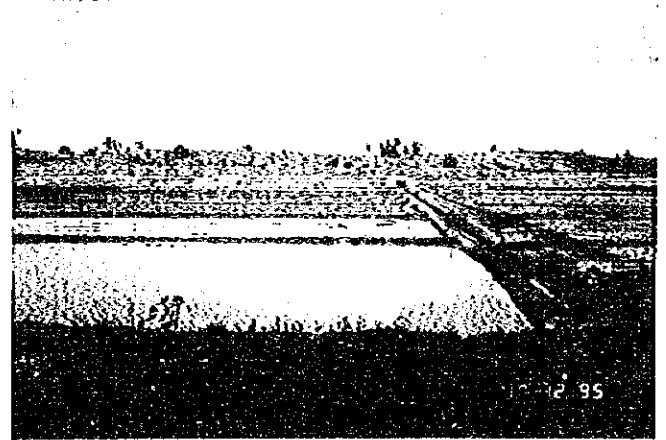
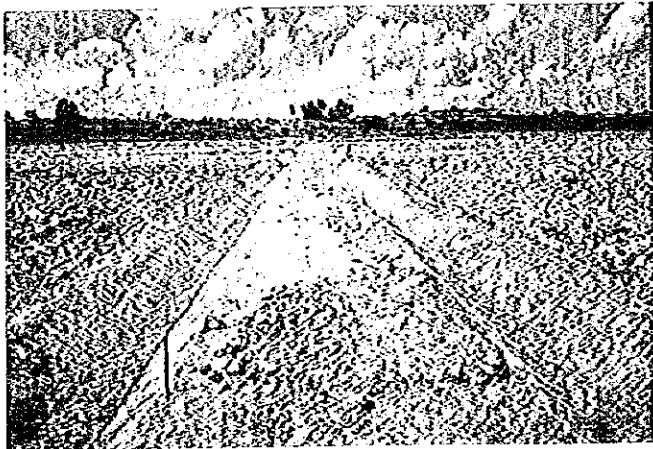


Paddy field construction work in Sabulakoa; Soil dressing work



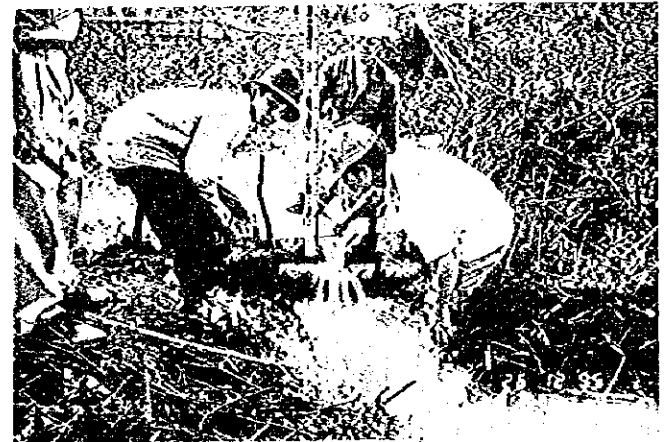
Paddy field construction work in Lalobao; Terminal irrigation ditch was constructed by farmers group work

Levee between paddy field lots were built by farmers in Lalobao. Fixed ruler was set by C/P.



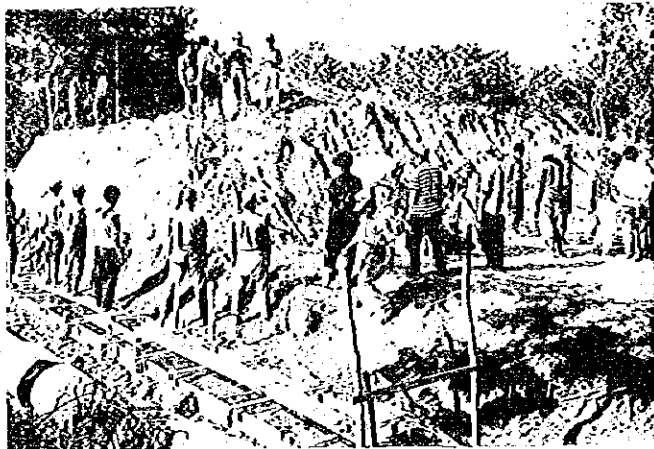
Completed paddy field, farm road and terminal irrigation ditch

Puddled paddy field prepared for transplanting in Lalobao



Reconstruction of intake weir in Sabulakoa

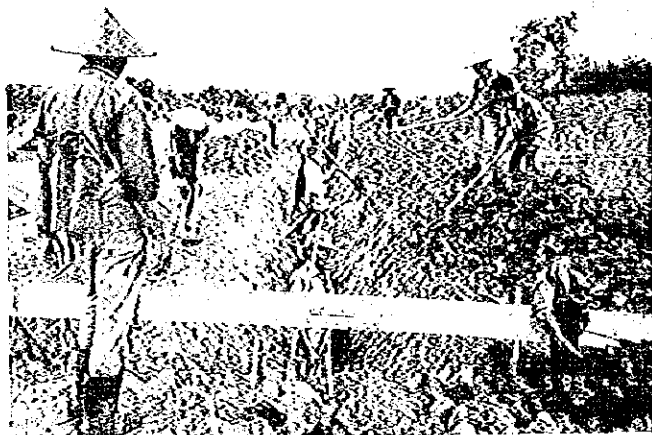
Runoff measurement by try-angle weir at the proposed intake weir site in Sabulakoa



Repairing of existing intake weir by force account work in Kiaea



Repairing of existing intake weir in Kiaea



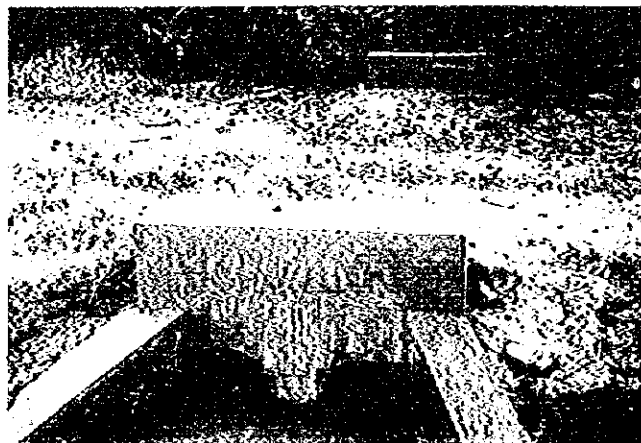
Excavation of canal done by farmer's group work
Some of their wage were saved for stock fund



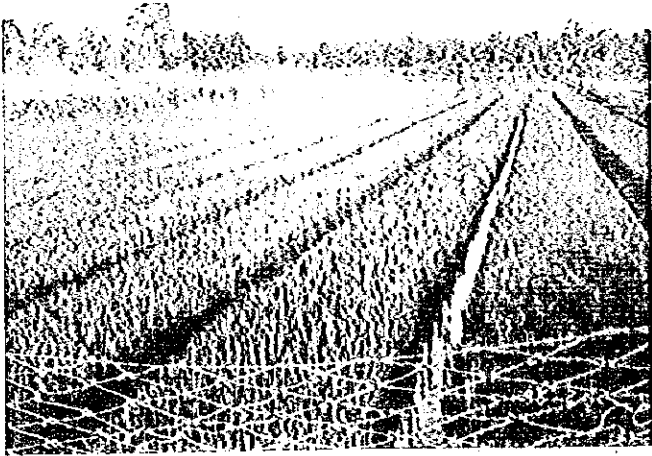
Quarry site for construction work in Palanga



Construction of irrigation hydraulic structure under contract woks supervised by C/P



Drainage conduit works crossing under farm road.
Appropriate technology was applied using plain concrete pipe.



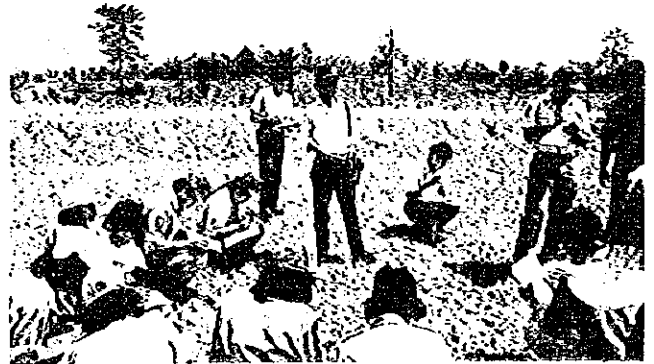
The good cropping of nursery at the newly developed paddy field in Lalobao



First settlement cropping of upland paddy in Traki tribe dominant village who have had custom of shifting agriculture



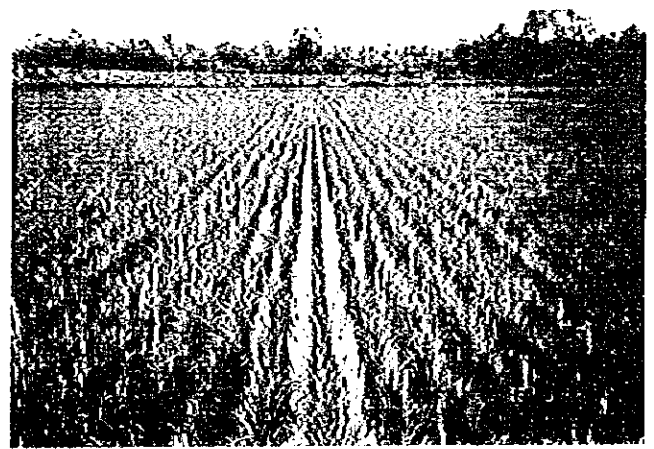
Expansion of upland field for settlement cropping, due to farmer's request



Site meeting of extension worker at the demonstration farm under technical guidance from the project



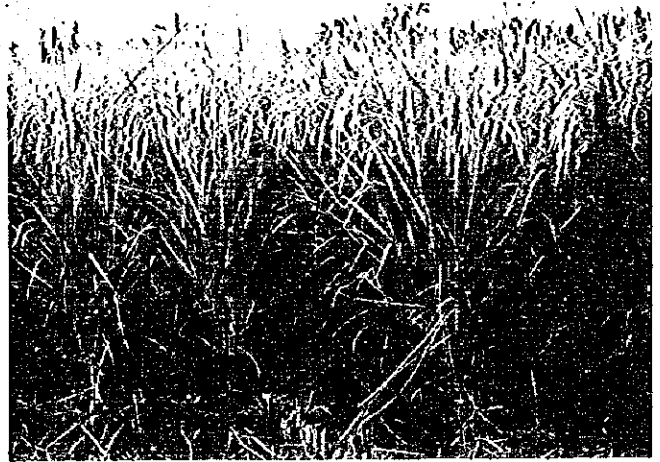
Peanut harvesting at the settlement farming field in dry Season. Areas of upland have been increased due to the strong desire from Traki.



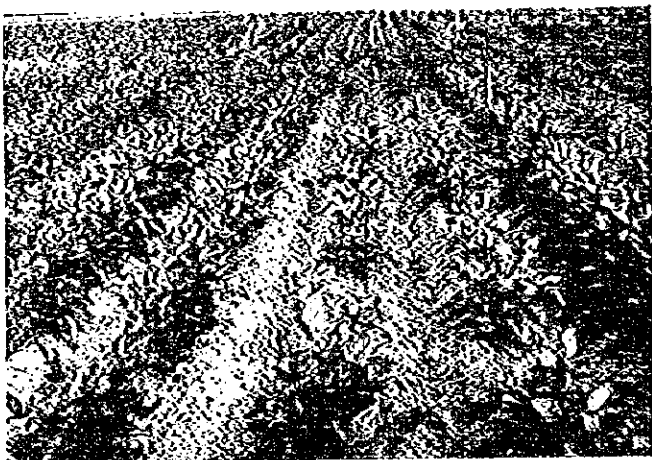
Newly developed paddy records high yield due to the technical guidance of the project



Paddy cultivation by direct sowing in line. Weeding by rotary weeding equipment.



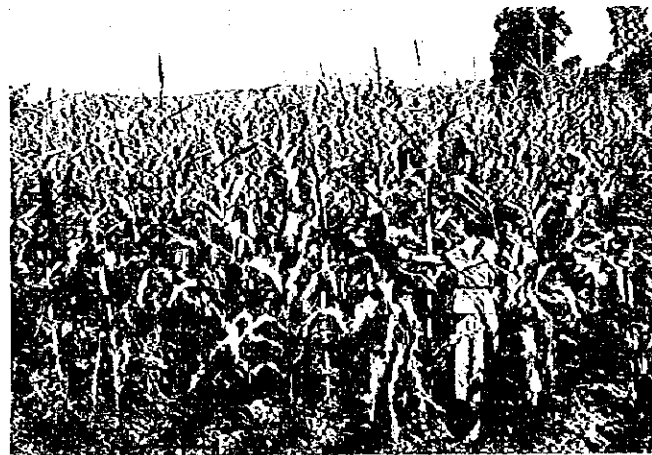
Good harvest by direct sowing in line cropping



Soybean cropping



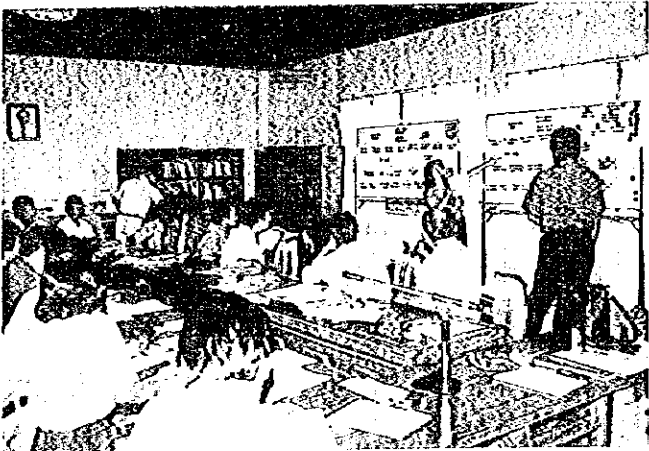
Corn cropping; Fertilizer application



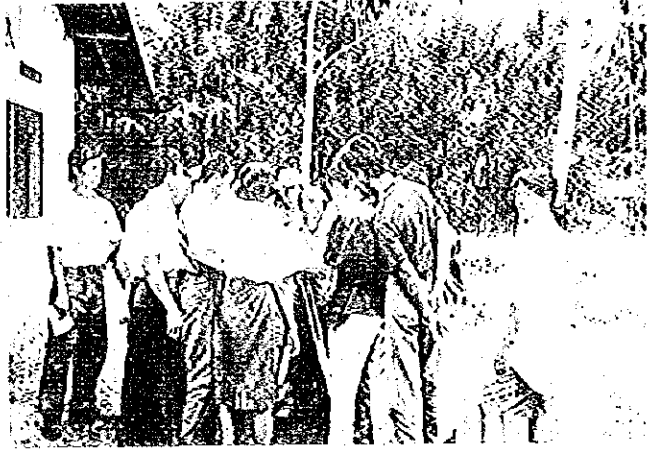
Corn cropping; Plowing work by supplied machinery



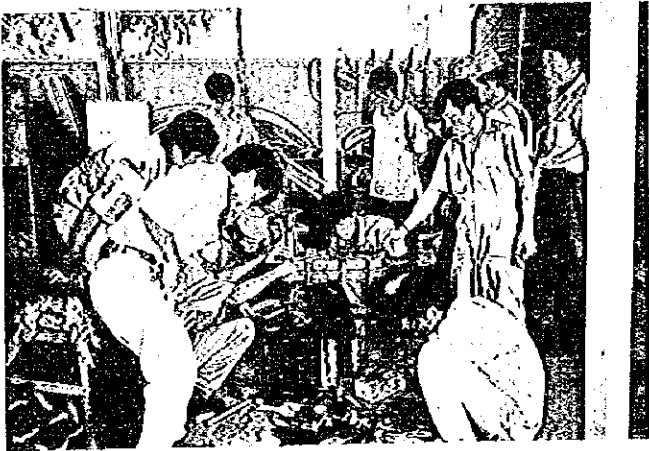
Plowing green manure into surface soil



Seminar on agricultural and rural development planning; work shop by PCM method



Seminar on farm land development; Plane-table survey for village official and key farmer



Seminar on maintenance of farming machinery for rural mechanic and operator



Study tour in Central Java; Village official and key farmer



Study tour on upland crop; extension worker



Rural women group seminar; Cashew nut processing in Ranometo