CHAPTER 7

CHAPTER 7 OPERATION AND MAINTENANCE PLAN

7.1 Work Items and Organization

(1) Operation of Agricultural Multi-purpose Transit Godowns

(a) Work items

The work items at the proposed godowns are as follows:

- Collecting and shipping of grain and agricultural inputs and labour management
- Quality control of grain (moisture content measurement, fumigation)
- Transportation of grain and agricultural inputs between village godowns and proposed godowns
- General administrative work for the above

(b) Organization

The operational works will be practiced under the branch office of the cooperative union. A storekeeper sent by the branch office as a permanent staff will control the operation works of the godown. The proposed organization chart is shown in Fig. 10. The proposed staff numbers of respective godown are shown below.

Staff	Grade	Proposed Godown			
		Kilolo	Ifwagi	Matembwe	Itundu
Storekeeper	Staff	1	1	1	1
Assistant Storekeeper	Staff	1	1	1	1
Collecting & Stacking Staff	Staff	1	1	1	1
Shipping Staff	Permanent Laborer	1	1	1	1
Staff for Agricultural Inputs	Permanent Laborer	1	1	1	1
Staff for Facility and Equipment	Permanent Laborer	1	1	1	1
Guard	Permanent Laborer	2	2	2	2
Clerk	Permanent Laborer	1	1	1	1
Laborer	Temporary Laborer	5,000	3,800	4,600	5,000

Note: Nos. of Temporary Laborer show the total man-days (See ANNEX 2-5).
Dairy labor requirement in peak season in each godown are estimated at 70 mm-days in Kilolo, 50 in Ifwagi, 60 in Matembwe and 70 in Itundu (See ANNEX 2-6)

(2) Operation and Maintenance of Feeder Road

(a) Work items

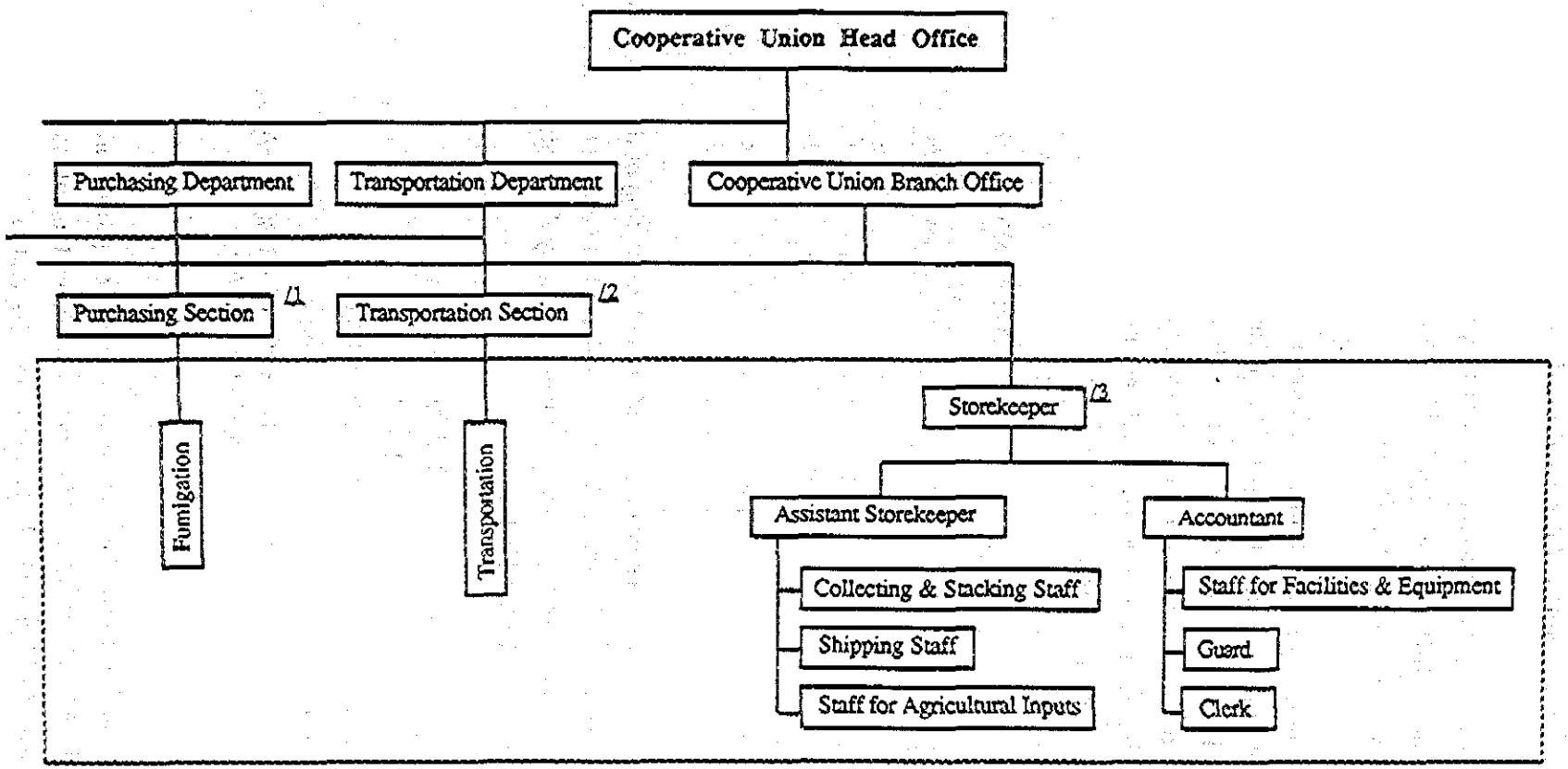
Work items for O&M of feeder road are as follows:

- Daily inspection and repair of road
- Arrangement of O&M equipment
- Checking and repair of O&M equipment
- General administrative work for the above

(b) Organization

The O&M works will be conducted mainly by the Regional Civil Engineering Department in concert with the Com & Works Department of the respective district. Present numbers of staff are shown below. It is judged that there is no need to provide additional offices and/or staff for the O&M work for proposed feeder road.

	Iringa Region Civil Engineering Department	Iringa District Com & Works Department	Mufindi District Com & Works Department	Njombe District Com & Works Department	Ludewa District Com & Works Department
Civil Engineer	3	2	2	2	1
Assistant	5	3	3	3	2
Specific Laborer (including equipment operator)	66	55	40	41	43
Laborer	140	88	78	79	102



1: The Section is existing.
2: The Section is to be newly provided.
3: A storekeeper will be newly staffed additionally

Fig. 10 Tentative Organization Chart in Proposed Godowns

7.2 Operation and Maintenance Cost of Transit Godown

Operation and maintenance (O&M) of the transit godowns will be executed by the existing cooperative unions, IMUCU and NOLUMA within their own budgets. It is not necessary to establish new management organizations.

The main cost items are operation and maintenance of the proposed godowns, fumigation cost and transportation cost. The operation and maintenance cost comprises salary and wages for staff and labourers, and fuel cost of the slat conveyors. Fumigation cost is composed of salary and wages and consumables like fumigation tablets, gas absorption canisters, etc. The transportation cost includes fuel and oils for operation of cargo trucks. These costs are summarized as shown below and the details of estimation are shown in ANNEX 2-7.

(Unit: 1,000 Tsh/year)

Item	Project Sites			
	Kitolo	Ifwagi	Matembwe	Itundu
O&M cost of godowns	472	396	445	472
Fumigation cost	307	233	270	342
Transportation cost	526	225	333	252
Total	1,305	854	1,048	1,066

The assumption of the saved amount of maize after implementation of the project will be about 1,300 tons a year which will be about 5% of the total handling amount of the project at the village level. The total profit of the cooperative unions born by the project will be about 5,300 thousand Tsh a year as calculated below.

Total handling amount of maize	:	26,000 tons/year
Loss of maize to be saved	:	1,300 tons/year
Buying price from farmers	:	8.20 Tsh/kg
Selling price to NMC	:	12.31 Tsh/kg
Profit	:	(12.31 - 8.20)/kg x 1,300 ton/year = 5,343,000 Tsh/year

The O&M costs envisaged will be covered by the expected profit born as the saving of loss of maize at the village level. This means that the operation and maintenance cost required will be sufficiently managed within the budget frame of the cooperative unions.

7.3 Operation and Maintenance Cost of Feeder Road

The operation and maintenance cost of the feeder road is estimated as shown below.

(Unit: 1,000 /year)

Cost Items	Amount
Operation cost of machinery (fuel)	943
Maintenance cost of machinery	189
Labour wages	41
Materials	59
Total	1,232

Note: The details are shown in ANNEX 2-8.

CHAPTER 8

CHAPTER 8 PROJECT EVALUATION

8.1 Project Benefits

The project benefits to be expected from the implementation of the Project for Improvement of Agricultural Storage and Transportation System in Iringa Region are evaluated as direct and indirect benefits as follows;

(1) Direct Benefits

1) Improvement of Transportation and Storage of Grain

Improvement of post-harvest facilities such as agricultural multipurpose godowns and the related feeder roads has not yet been achieved. As a result of the deficiency in the above facilities, smooth collection and selling of grain has not yet been secured.

The improvement of the agricultural storage and transportation system in rural areas including the project area has been carried out by the cooperative union since 1984, but it has not yet achieved mainly due to the shortage of funds in the union. The proposed improvement of facilities such as construction of godowns, the improvement of feeder roads and the supply of cargo trucks and equipment for the maintenance of roads is expected to greatly contribute to improving the transportation and storage of grain.

2) Reduction of Post-harvest Loss

The normal marketable surplus of maize in the project area is estimated to be about 48,000 tons per annum, yet the agricultural storage and transportation systems are still in a severe state as previously described. As a result of the deficiency in the facilities, deterioration and loss of maize at the production stage due to the accumulation of undelivered maize have become a serious problem. It is expected that, thanks to the implementation of the Project, post-harvest handling loss of maize will be minimized.

The cooperative unions in the project area deal with a total amount of about 26,000 tons of grain per annum. Upon completion of the Project, it is predicted

that the post-harvest loss at the farmers level will be decreased to approximately five (5) percent, or 1,300 tons, of the above grain.

(2) Indirect Benefits

1) Reinforcement of the Cooperative Systems

The Government of Tanzania puts stress on the promotion of the cooperative union/cooperative society system as one of its most important agricultural policies. In Iringa Region, two cooperative unions called IMUCU and NJOLUMA were established in 1984. IMUCU and NJOLUMA, which has their head offices in Iringa and Njombe town respectively, deal in collecting and selling farm products and in the transportation. However, the operation has been affected mainly by the shortage of storage, insufficient improvement of feeder roads and the deficiency in transportation cargo trucks.

Actual operation and management of the storage facilities to be constructed under the Project will be entrusted to IMUCU and NJOLUMA under the control of the RDD's office, Iringa Region. As a result of implementation of the Project, the farm products activities of IMUCU and NJOLUMA will be reinforced substantially, in accordance with the cooperative system reinforcement policy of the Government of Tanzania.

2) Demonstration Effects

The cooperative unions have prepared a comprehensive plan on the improvement of godowns and feeder roads in the Region under the control of the RDD's office, Iringa Region. However, the above improvement has not been achieved yet due to mainly the shortage of funds. Implementation of the Project will create an integrated transportation and storage system for grain. Such an integrated system is expected to have beneficial demonstration effects as a model of agricultural development projects to the other regions such as Mbeya, Rukwa and Ruvuma.

3) Stabilization of Social Welfare Condition

As a result of the implementation of the project, it is expected that the collection, distribution and transportation of grain will be reinforced, and consequently grain will be distributed more smoothly and swiftly by the cooperative unions and NMC. The implementation of the project will contribute to stabilization of social

welfare in the area through improving the living standard of farmers and giving farmers incentives for farming.

8.2 Project Viability

From the following standpoints, it is concluded that implementation of the Project is highly viable.

(1) Implementation System

The implementation organization of the project is the RDD's office in Iringa Region. The RDD's office has no experience as an implementation organization of Japan's grant aid projects. However, the office is being re-organized so as to implement the grant aid project under the control of the RDD's office in Kilimanjaro Region, and the Agricultural and Livestock Department, which are familiar with grant aid project programs. It is judged, therefore, that there will be no problem in the implementation system of the Project.

(2) Operation System

In operating the Project, it is required that the operational organization has high administrative abilities in the various aspects of the operational work on the collection, selling and transportation of the farm products. IMUCU and NJOLUMA, the operational organizations of the Project, already have functions as marketing organizations of farm products in rural areas, undertaking various activities such as operation of godowns, the management of selling and transport, etc. Thus, it is judged that IMUCU and NJOLUMA have sufficient abilities as stated before. The Civil Engineering Department of the RDD's office will be in charge of the operation and maintenance of feeder roads, undertaking various activities such as adjustment and communication with other organizations.

As the maintenance equipment for roads will be operated by the Civil Engineering Department of the RDD's office, no operation problems are expected to occur. It is judged that the Civil Department of the RDD's office can function well as the operational organization for the maintenance of roads.

(3) Financial Viability of Operation and Maintenance

The major direct benefit through the implementation of the Project is the reduction of post-harvest loss of grain at the farmer's level. The operation and maintenance costs of the

proposed storage facilities will be absorbed in the profit from the reduction of post-harvest loss, {reduction of post-harvest loss is volume x (selling price to NMC - buying price from cooperatives)}. Thus, the Project is financially feasible.

(4) Urgent Necessity of the Project

To reduce post-harvest loss of grain and to stabilize the grain supply are important problems that need to be solved urgently by Tanzania, which aims at self-sufficiency in food. Therefore, it is judged that the Project should be implemented as soon as possible.

CHAPTER 9

CHAPTER 9 CONCLUSION AND RECOMMENDATION

9.1 Conclusion

As a result of the field survey in Tanzania and analysis works in Japan, it was clarified that very considerable direct and indirect benefits can be expected from implementation of the proposed Project. As described in CHAPTER 8, the expected direct benefits will be the reduction of post-harvest loss through the improvement of the cooperative union and the transport and storage infrastructure, and the expected indirect benefits will be reinforcement of the cooperative system, demonstration effects to other surplus regions in food production, extension of improvement on marketing infrastructure, promotion of agricultural productivity, improvement of farmer's living condition, and stabilization of social welfare conditions. In addition, the Regional Government of Iringa identifies the Project as a leading model scheme for future agricultural development in the region.

It was confirmed that there is no organizational problem in the RDD's office, which will take charge of the Project implementation. IMUCU and NJOLUMA will be the organizations responsible for actual operation and maintenance of the facilities under the control of the RDD's office, the Civil Department of the RDD's office will be responsible for maintenance of the improved feeder roads and consequently it is considered that there will be no problem regarding the promotion of the Project.

Since Tanzania's national budget, however, has shown deficits due to the worldwide recession and bad export conditions, it is judged that it is hard for the Government of Tanzania to finance the required construction cost of the Project. As for the form of foreign aid for Tanzania, grants provide the largest amount.

It is concluded that the necessity for implementation of the proposed project is extremely significant and that the scope of the Project is favorable and appropriate for a grant aid from the Government of Japan, considering the background and objectives of the Project, the expected project benefits and the national economic conditions of Tanzania. It is desirable that the Project will be implemented as soon as possible since the improvement of the transport and storage infrastructure for farm products is of urgent necessity in order to stabilize the supply of food grain to the area falling short of grain and to attain self-sufficiency in food by reducing the post-harvest loss of grain.