

The United Republic of Tanzania
Ministry of Infrastructure Development (Moid)

PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR
UPGRADING MASASI MANGAKA ROAD
IN
THE UNITED REPUBLIC OF TANZANIA

SEPTEMBER 2009

JAPAN INTERNATIONAL COOPERATION AGENCY

INGÉROSEC CORPORATION

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PREFACE

Japan International Cooperation Agency (JICA) conducted the preparatory survey on the Project for Upgrading Masasi Mangaka Road in the United Republic of Tanzania.

JICA sent to Tanzania a survey team from April 18 to May 6, 2009.

The team held discussions with the officials concerned of the Government of Tanzania, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Tanzania in order to discuss a draft outline design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the United Republic of Tanzania for their close cooperation extended to the teams.

September 2009

Shigenari Koga

Director General, Financing Facilitation
and Procurement Supervision Department
Japan International Cooperation Agency

September 2009

LETTER OF TRANSMITTAL

We are pleased to submit to you the preparatory survey report on the Project for Upgrading Masasi Mangaka Road in the United Republic of Tanzania..

This survey was conducted by Ingérosec Corporation, under a contract to JICA, during the period from April to September, 2009. In conducting the survey, we have examined the feasibility and rationale of the project with due consideration to the present situation of Tanzania and formulated the most appropriate outline design for the project under Japan's Grant Aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Hideaki Morita
Project manager,
Preparatory Survey team on the Project for
Upgrading Masasi Mangaka Road
Ingérosec Corporation

SUMMARY

SUMMARY

1. Country Outline

The United Republic of Tanzania (hereinafter referred to as Tanzania), located half way up the eastern coast of Africa facing the Indian Ocean, has a national land area of approximately 945,000 km². Inland it consists of vast tableland ranging between 1,000~2,000 m in altitude, and the north is dominated by the towering presence of Mt. Kilimanjaro (5,895 m). The Project road is situated in the south of Tanzania and crosses gently undulating land at an altitude of between 250~420 m. Annual rainfall is around 1,000 mm per year and the rainy season lasts from November to April. Average monthly temperature ranges between 24~28°C and remains fairly constant throughout the year.

After achieving independence, Tanzania promoted a policy of socialism, however, due to the effects of the oil shocks, war with Uganda and drought, the economy reached a critical state in the 1980s. In order to improve this situation, from 1986 onwards, Tanzania implemented economic reforms under guidance from the World Bank and IMF, and recently the GDP has displayed growth of 7.1% in 2003 and 6.3% in 2004. Moreover, per capita GNP has also shown steady improvement, growing from US\$210 in 1997 to US\$400 in 2007.

2. Background, History and Outline of the Requested Project

In the Poverty Reduction Strategy Paper (formulated in October 2000), which is regarded as the national development plan for Tanzania, high priority is given to improvement of access to cities and rural villages, repair of trunk and local roads, and maintenance of already repaired trunk and local roads, in order to improve the level of services available for transporting goods and people. Regarding road development, the 10-Year Road Sector Development Plan (10Y-RSDP, 2001~2011) that was compiled in 2001 is the superior plan to the Project. This aims to promote development and maintenance of national trunk roads and provincial roads divided according to nine road corridors. Eventually, it aims to link all provinces by provincial roads in order to connect agricultural production areas to consumer centers and thus promote economic growth of rural areas.

The Project road between Masasi and Mangaka is regarded as an important trunk road forming part of the southern development corridor (Mtwara Corridor) that is composed of Highway 6 and Highway 12 in the 10Y-RSDP. Moreover, in line with development related to the Mtwara Corridor, for example, the start of construction of the Unity Bridge connecting Tanzania and Mozambique south of the Project road, it is anticipated that the Project, which will be part of the corridor, will also function as an international route.

The population of Mtwara Province where the Project is situated is approximately 1,130,000 (440,000 in Masasi Prefecture where the road is situated), and this accounts for roughly 3% of the national population of 38,300,000 (2005). The main industry in the area is agriculture, which accounts for between 70~75% of production and employs roughly 80% of the working population. The major crop is cashew nuts, with this area accounting for 50% of national production and having a reputation for good quality; however, due to the inadequate development of the access road network, half of the cashew crop cannot be shipped. Accordingly, development of the road network is urgently required.

In April 2004, the Government of Tanzania implemented a feasibility study on the Mtwara Corridor (road between Mtwara and Mbamba Bay) under support from the Kuwait Fund. Furthermore, in view of the importance of road development along the Mtwara Corridor, the Government of Tanzania in November 2004 issued a request to the Government of Japan for the provision of grant aid assistance for the section between Masasi and Tunduru (190 km).

In response to the request, due to concerns over the effect on the environment of the Project, JICA implemented a Project formation study from July to August 2005. Through this study, it was reported that the impact could be mitigated through balancing development with environmental conservation and the importance of development along this route was reaffirmed.

In addition to confirming the advantages of the Project based on the findings of the Project formation study, the Government of Japan narrowed down the total route of 190 km to a relatively high priority section between Masasi and Mangaka and dispatched the preliminary survey team to investigate it. In this survey, it was confirmed that the Project entails no major problems regarding the natural environment and is valid for development in view of the work being done on the trunk road from Dar es Salaam to the target area.

On receiving the findings of these studies, JICA implemented the Basic Design Study from July 2006 to March 2007, during which the project specifications and implementation plan were examined. As a result of the study, the need and urgency of road repair on the requested section were confirmed upon investigating production conditions of the major local crop of cashew nuts, progress of development of the area around the terminus of the target section, progress in construction of Unity Bridge on the border with Mozambique, and so on, and the Project was moved to the implementation stage.

Table 1 Past Studies

| Study | Year of Implementation | Implementing Agency | Study Section | Outline of Study Findings |
|-------------------------|------------------------|---------------------|---------------------|--|
| Feasibility Study (F/S) | April 2004 | Kuwait Fund | Mtwara - Mbamba Bay | Targeting the total 839 km extension |
| Project Formation Study | July 2005 | JICA | Masasi - Tunduru | Targeting a 190 km section |
| Preliminary Study | February 2006 | JICA | Masasi - Mangaka | Targeting a section of approximately 54 km |
| Basic Design Study | March 2007 | JICA | Masasi - Mangaka | Targeting a section of approximately 55.1 km |

Concerning Project implementation, in the Basic Design Study, it was decided to divide the works into three phases as indicated below. Phase-1, which entailed work on the 15 km section from the start point in suburban Masasi, was started in November 2007 and completed in March 2009.

Concerning the Phase-2 works, in the detailed design that was implemented in May 2008, since it was confirmed that construction materials had undergone massive inflation due to the sudden rise in the global price of crude oil and so on at that time, the project plan was reexamined taking this into account. As a result, the possible works quantity in Phase-2 had to be downsized from the 20 km envisaged in the basic design to 17.6 km (reduction of 2.4 km), and these works targeting the 17.6 km section from the end point of the Phase-1 works (15 km from Masasi city) to the 32.6 km point are currently in progress.

In view of the above results, in order for the road construction project between Masasi – Mangaka to have an effect, it will be necessary to add the above reduction of 2.4 km to the originally planned section of 20.1 km, thereby resulting in 22.5 km, in the Phase-3 works. As a result, it was decided to implement a project preparation study (project actualization study) on this section (see the figures below).

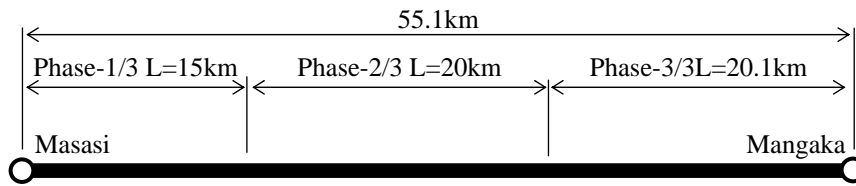


Figure 1 Section Division at Time of the Basic Design Study

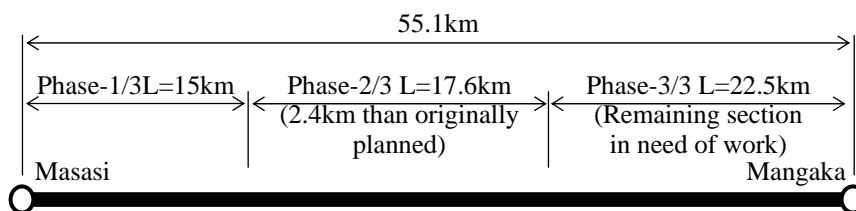


Figure 2 Section Division at Time of the Project Preparation Study (Project Actualization Study)

3. Outline Results of the Study and Contents of the Project

The Japan International Cooperation Agency dispatched the Project Preparation Study Team from April 18 to May 6, 2009. In addition to holding discussions with related government agencies in Tanzania, the Study Team implemented field surveys in the target area and confirmed the need and urgency of road repair on the requested section in light of current conditions, progress of development around the terminus of the target section, progress in construction of Unity Bridge on the border with Mozambique, and so on. Upon conducting work in Japan after returning home, the Study Team compiled the rehabilitation plan for the requested road as shown in the next table, returned to Tanzania to explain the outline report of the Project Preparation Study between August 22 and August 29, 2009 and secured the basic consent of the Government of Tanzania for this.

Table 2 Outlined design contents

| Design item | | Design contents |
|--|---|--|
| Length of the section covered by the Project | | Out of the total route (55.1 km) from Masasi to Mangaka, the 22.5 km section from the 32.6 km point to the end point in Mangaka. |
| Pavement structure | Surface course | Double bituminous surface treatment (DBST, main road, access roads, bus stops, etc.) |
| | | Single bituminous surface treatment (SBST, shoulders, entrances) |
| | Base | 15 cm base work (cement stabilization - main road, access roads, bus stops, etc.) |
| | | 20 cm subbase work (granular materials – main road, shoulders) |
| Design axle load | TLC3 (according to the Tanzania Highway Manual) | |
| Road width | Pavement width | 6.5 m (single side 3.25 m, 2 lanes) |
| | Shoulder width | 1.5 m, both sides |
| Improvements to bridges and crosswise traversing drainage structures | | 35 places (including 27 pipe culverts, 5 box culverts, and 3 bridges (each 30 m and 3 spans)) |
| Other auxiliary facilities | | Side ditches, retaining walls, bus stops, protective fences, signs, partition lines, etc. |

4. Project Schedule and Estimated Project Cost

As a result of the above study, in the event where the Project is implemented under the Grant Aid Scheme of the Government of Japan, it is estimated that tender-related work will require 3 months, construction works will require 15 months, and that the rough Project cost will be 1.516 billion yen.

5. Verification of Project Appropriateness

Since implementation of the Project will lead to the improvement of road conditions and realization of safe and smooth traffic on the target section, the entire population of Mtwara Province of approximately 1,130,000 people will realize the benefit. The following effects are anticipated from Project implementation.

Direct effects

- Increase in road traffic volume due to improvement in the road standard
- Shortening of travel times for vehicles using the road (the travel time between the target section of 22.5 km out of the total Masasi-Mangaka section of 55.1 km will be shortened from 45 minutes to 17 minutes).
- Shortening of travel times for vehicles using the road (the travel time between the 55.1 km section between Masasi-Mangaka will be shortened from 83 minutes to 42minutes).

Indirect effects

- Reduction of transportation costs due to shortening of transportation times and improvement of flatness
- Contribution to local development, rectification of regional disparities, expansion of the market area, and stabilization of access to medical and education facilities through improvement in road reliability
- Contribution to stronger and more stable physical distribution through improvement in access

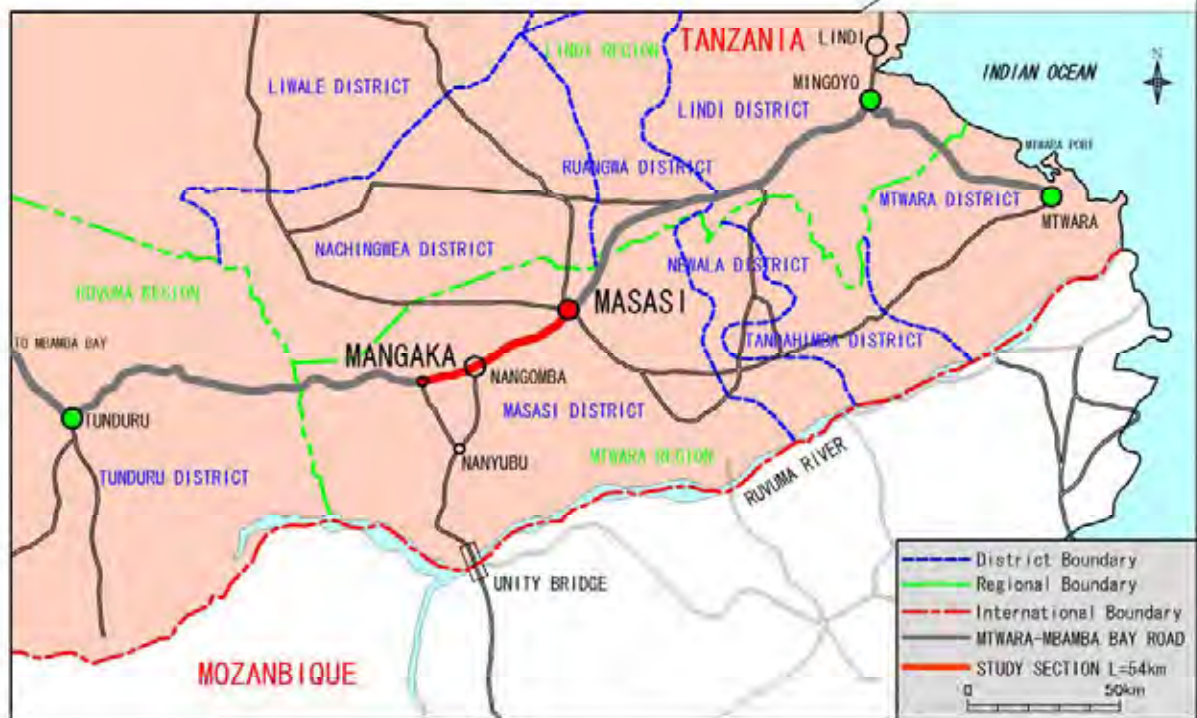
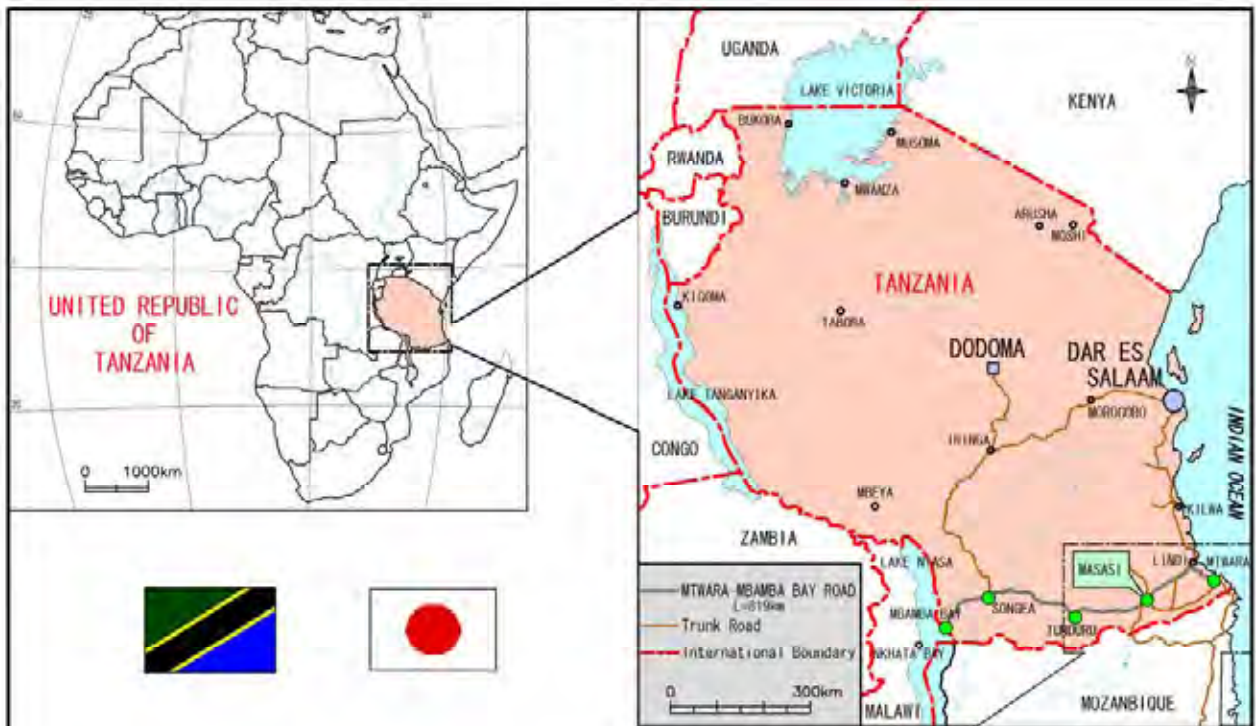
As can be seen, since the Project will impart major benefits to the population of Tanzania and greatly contribute to improving convenience for local residents, it is deemed to have major significance for implementation under the Grant Aid Scheme of the Government of Japan. Moreover, concerning maintenance aimed at ensuring the long-term functioning of the facilities following completion, the Tanzanian implementing agencies are considered to have ample capability in view of their past experience.

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Exchange rate: 1US\$=95.77 yen (estimation point: May 2009)



**BASIC DESIGN STUDY ON THE PROJECT
 FOR
 DETAILED DESIGN AND UPGRADING TO BITUMEN STANDARD
 OF THE 54KM MASASI-MANGAKA ROAD SECTION
 OF THE MTWARA-MBAMBA BAY ROAD**

LOCATION MAP



PERSPECTIVE

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ABBREVIATIONS

| | |
|----------|--|
| AfDB | African Development Bank |
| BS | British Standard |
| CBR | California Bearing Ration |
| CRB | Contractor Registration Board |
| DANIDA | Danish International Development Assistance |
| DBST | Double Bituminous Surface Treatment |
| DCP | Dynamic Cone Penetration |
| EIA | Environmental Impact Assessment |
| EU | European Union |
| GNI | Gross National Income |
| GDP | Gross Domestic Product |
| GNP | Gross National Product |
| GOT | Government of Tanzania |
| JICA | Japan International Cooperation Agency |
| M/D | Minutes of Discussion |
| MoID | Ministry of Infrastructure Development |
| NDC | National Development Cooperation |
| NEMC | National Environmental Management Council |
| NSGRP | National Strategy for Growth and Reduction of Poverty |
| OPEC | Organization of Petroleum Exporting Countries |
| RAP | Resettlement Action Plan |
| RC | Reinforced Concrete |
| ROW | Right of Way |
| SADC | Southern African Development Community |
| SATCC | Southern African Transport and Communications Commission |
| SBST | Single Bituminous Surface Treatment |
| TANROADS | Tanzania National Roads Agency |
| TLC | Traffic Load Class |
| Tshs | Tanzania Shillings |

CHAPTER 1

BACKGROUND OF THE PROJECT

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1.1 Background and Outline of the Request for Grant Aid

The Project road between Masasi and Mangaka is regarded as an important trunk road forming part of the southern development corridor (Mtwara Corridor) that is composed of Highway 6 and Highway 12 in the 10Y-RSDP. Moreover, in line with development related to the Mtwara Corridor, for example, the start of construction of the Unity Bridge connecting Tanzania and Mozambique south of the Project road, it is anticipated that the Project, which will be part of the corridor, will also function as an international route.

The population of Mtwara Province where the Project is situated is approximately 1,130,000 (440,000 in Masasi Prefecture where the road is situated), and this accounts for roughly 3% of the national population of 38,300,000 (2005). The main industry in the area is agriculture, which accounts for between 70~75% of production and employs roughly 80% of the working population. The major crop is cashew nuts, with this area accounting for 50% of national production and having a reputation for good quality; however, due to the inadequate development of the access road network, half of the cashew crop cannot be shipped. Accordingly, development of the road network is urgently required.

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Concerning Project implementation, in the Basic Design Study, it was decided to divide the works into three phases as indicated below. Phase-1, which entailed work on the 15 km section from the start point in suburban Masasi, was started in November 2007 and completed in March 2009.

Concerning the Phase-2 works, in the detailed design that was implemented in May 2008, since it was confirmed that construction materials had undergone massive inflation due to the sudden rise in the global price of crude oil and so on at that time, the project plan was reexamined taking this into account. As a result, the possible works quantity in Phase-2 had to be downsized from the 20 km envisaged in the basic design to 17.6 km (reduction of 2.4 km), and these works targeting the 17.6 km section from the end point of the Phase-1 works (15 km from Masasi city) to the 32.6 km point are currently in progress.

In view of the above results, in order for the road construction project between Masasi – Mangaka to have an effect, it will be necessary to add the above reduction of 2.4 km to the originally planned section of 20.1 km, thereby resulting in 22.5 km, in the Phase-3 works. As a result, it was decided to implement a project preparation study (project actualization study) on this section (see the figures below).

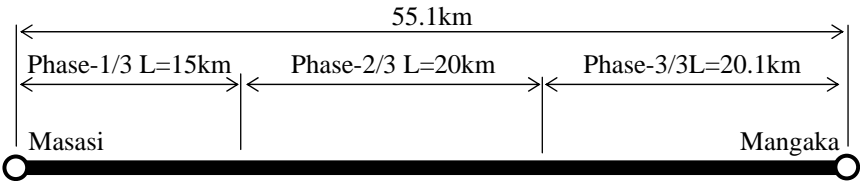


Figure 1-1 Section Division at Time of the Basic Design Study

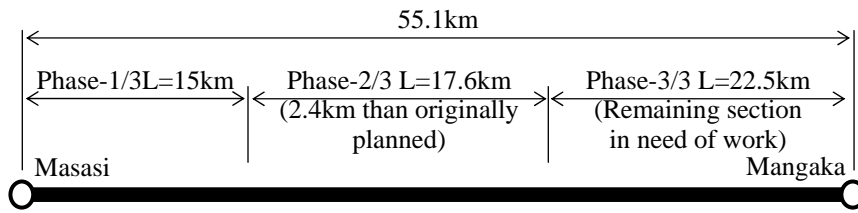


Figure 1-2 Section Division at Time of the Project Preparation Study (Project Actualization Study)

1.2 Natural Conditions

The United Republic of Tanzania (hereinafter referred to as Tanzania), located half way up the eastern coast of Africa facing the Indian Ocean, has a national land area of approximately 945,000 km². Inland it consists of vast plains ranging between 1,000~2,000 m in altitude, and the north is dominated by the towering presence of Mt. Kilimanjaro (5,895 m). The Project road is situated in the south of Tanzania and crosses gently undulating land at an altitude of between 250~420 m. Annual rainfall is around 1,000 mm per year and the rainy season lasts from November to April. Average monthly temperature ranges between 24~28°C and remains fairly constant throughout the year.

(1) Topographical conditions

The road between Masasi and Mangaka reaches a peak altitude of around 420 m in the vicinity of Masasi and gently slopes downwards to around 400 m moving west. The start point of the target section of the Study (the Phase 3 works) is 32.6 km from Masasi. 2 kilometers from here, the area around Mbangala river basin at the 35 km point is at the lowest altitude of around 250 m, and from there it undulates at around 300 m and reaches around 350 m at the terminal point. The topography in general is gently undulating, and there are only a few sections where the longitudinal profile exceeds 5%.

(2) Geological conditions

The geological makeup sharply divides at Nganga, situated approximately 60 km in the direction of Mtwara (east side) going from inland Masasi. The area east of Nganga (towards Mtwara) comprises Mesozoic sand and peat soil, whereas land on the west (towards Masasi), crossing over Mtwara District and entering Ruvuma District, consists of marble, quartz and black coal from the Paleozoic age. Moving from the Project start point



Rock hills alongside the target road

of Masasi towards the terminal point, rock hills (sandstone) are scattered on both sides of the road at intervals of a few kilometers. The stone aggregate required in the Project can be procured from the TANROADS quarry at Chepite, which is located approximately 60 km in the coastal direction from the Project start point (envisaged at the time of the BD) of Masasi town.

1.3 Environmental and Social Consideration

(1) EIA progress

Concerning environmental procedures in Tanzania, based on the environmental management approach (EMA), it is obligatory to implement environmental impact assessment (EIA) and take the EIA procedures required in screening conducted by the National Environmental Management Committee (NEMC). Concerning EIA, the NEMC issued a No Objection Letter to TANROADS on February 1, 2007, and the EIA completion report was confirmed during the site survey in August 2009.

(2) Progress of the resettlement action plan (RAP)

Existing buildings

The right of way (ROW) of the target road is 45 m, i.e. 22.5 m each way from the centerline of the existing road. Houses that exist within this right of way have received advance notification from TANROADS that they will be targeted for relocation (a red 'X' mark has been painted on the building walls). The number of such buildings in the preparatory survey was counted as 202 (see the following table), and Mangaka suburban district had the highest number of 55. As is indicated above, because TANROADS has painted 'X' marks on targeted buildings, almost all the owners of buildings inside the ROW can understand that they will need to relocate.



“X” mark on the building wall



Existing well

Table 1-2 Houses and Facilities inside the ROW

| No. | Village | Right Side (Mangaka Direction) | | | | Left Side (Mangaka Direction) | | | | Total |
|-----|-----------|--------------------------------|--------|--------|-------|-------------------------------|--------|--------|-------|-------|
| | | Houses/ Shops | Kiosks | Others | Total | Houses/ Shops | Kiosks | Others | Total | |
| 1 | Nahimba | 6 | - | - | 6 | - | 2 | - | 2 | 8 |
| 2 | Nangaramo | - | - | - | 0 | - | 3 | - | 3 | 3 |
| 3 | Nangomba | 19 | - | - | 19 | 29 | 1 | - | 30 | 49 |
| 4 | Ndwika | 3 | - | - | 3 | 5 | - | - | 5 | 8 |
| 5 | Mangaka | 29 | 6 | - | 35 | 17 | 2 | 1 | 20 | 55 |
| | Total | 57 | 6 | - | 63 | 51 | 8 | 1 | 60 | 123 |

Source: Preliminary Survey Report

As is shown above, affected residents have been made aware by the painting of “X” marks on buildings by TANROADS that houses inside the ROW will be subject to removal. Moreover, since there is enough room to basically set back affected houses and buildings from their current positions, any major impacts can be averted.

In view of the above conditions, there is little likelihood that the removal of residents from the existing ROW will cause major problems. Apart from buildings, a well equipped with hand-pump and located 6 m from the road edge in Mangaka will also need to be examined for transfer. The estimate of construction work costs for moving the well has been obtained from the Masasi zonal office.

CHAPTER 2

CONTENTS OF THE PROJECT

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2.1 Project Outline

2.1.1 Superior Objectives and Project Goals

(1) Superior Objectives

Concerning road development plans in Tanzania, in the Poverty Reduction Strategy Paper (formulated in October 2000), which is regarded as the national development plan for the country, high priority is given to improvement of access to cities and rural villages, repair of trunk and local roads, and maintenance of already repaired trunk and local roads, in order to improve the level of services available for transporting goods and people.

Regarding road development, the 10-Year Road Sector Development Plan (2001~2011) was compiled in 2001. This aims to promote development and maintenance of national trunk roads and provincial roads divided according to nine road corridors, and eventually, it aims to link all provinces by trunk roads and provincial roads. Through doing this it is anticipated that stable supply of agricultural products to consumer centers will be secured and the economic growth of rural areas will be promoted. The Project road between Masasi and Mangaka is regarded as an important trunk road forming part of the southern development corridor (Mtwara Corridor), which traverses the southern part of the country, and it is anticipated that the Project road will also function as an international route of physical distribution.

(2) Project goals

The Project target area in the south of Tanzania has historically been underdeveloped, however, it is blessed with agricultural production resources, mineral resources and tourism resources and has a lot of potential for economic development. Concerning the main industry, agriculture accounts for 70~75% of local production, and many households are engaged in farming. The major crop is cashew nuts, with this area accounting for 50% of national production and having a reputation for good quality; however, due to the inadequate development of the access road network, half of the cashew crop cannot be shipped, so development of the road network is urgently required.

The Project target road, which forms part of an important access road network in the area, is only 3~5 m width, which is too narrow to allow safe two-way traffic. Moreover, it suffers from impassability caused by rain corrosion, while rutting of the road surface leads to contact between

vehicles and falls by pedestrians and bicycles. Against such a background, the Project has the objective of securing the safe and smooth flow of traffic along the target section through upgrading the section between Masasi and Mangaka.

2.1.2 Project outline

In the Project, the following road repairs and improvements will be implemented in order to realize the above goals.

- Target section : Between Masasi and Mangaka (55.1 km in total), on the National Route 6
- Target stretch : 22.5 km (Phase-3 section)
- Road specifications : Roadway = 3.25 m single side, total 6.50 m
Shoulder width = 1.5 m, both sides
- Paving specifications : Roadway = double bituminous surface treatment (DBST)
Shoulder = single bituminous surface treatment (SBST)
- Road drainage facilities : 27 pipe culverts, 5 box culverts, bridge rebuilding in 3 places, 8,700 m of stone ditches
- Road incidental facilities : Guard rail/posts, bus stops, kilometer posts, surface markings, etc.

2.2 Outline Design of the Japanese Assistance

2.2.1 Design Policy

2.2.1.1 Basic Policy

Construction of the target road section is indispensable for securing stable transportation of local agricultural products to consumer areas, promoting roadside development through promotion of mining, tourism and international transportation, reducing poverty and improving the social environment in the local area.

Against this background, the basic policy of design in the Project aiming for improvement of the target road section is indicated below.

- i) The geometric structure of the Project road shall satisfy the required conditions of a trunk road.
- ii) A plan that ensures compatibility with the overall Mtwara Corridor shall be examined.
- iii) The composition and characteristics of traffic on the road (automobiles, trucks, buses, bicycles, pedestrians, etc.) shall be examined and reflected in the Project.
- iv) The Project road shall fit within the right of way of the existing road.

The basic design study was implemented on the Project target section of 55.1 km (which includes the target of this Study) between Masasi and Mangaka in March 2007, and the basic specifications and schedule (three phases) for the Project were established. The Phase-1 works covering the 15 km section from Masasi were completed in March 2009, and currently the Phase-2 works are underway, although the target section of Phase-2 has been reduced by 2.4 km from the originally intended 20 km to 17.6 km due to the impact of inflation in construction materials in 2008.

Concerning the target section here, surveys and examinations were implemented into the necessary and optimum Project contents and scale, implementation plan, scope of works on the Tanzanian side and Project costs, etc. regarding the Phase-3 works, which will target 22.5 km of road, i.e. the originally planned 20.1 km plus the 2.4 km that was omitted from Phase-2. The following paragraphs outline and contents and results of the examinations that were implemented in the Study.

2.2.1.2 Design Policy and Important Points to Consider

(1) Design Policy

Current conditions over the target section were confirmed in site surveys conducted in April 2009. As a result of the site surveys, since no major topographical alterations, local development projects, changes to residential areas or any other changes that would require major revision of the policy adopted in the basic design were observed, the Project will be examined according to the same design policy as adopted in the Basic Design.

(2) Target Section

Since conditions along the route have not undergone any major changes compared to the time of the basic design study and there are no new related plans that will have a big impact on the Project, examination was conducted on the Phase-3 works targeting a section of 22.5 km including the part that had to be shortened in Phase-2.

In terms of road improvement plans related to the Project, the Tanzanian side is implementing a plan for the connecting road between Mangaka and Unity Bridge. Detailed design on the part of this connecting to the Project road at Mangaka (corresponding to the specifications in this project) was completed in February 2009, and the government is making various overtures and examining various options with a view to securing funding for the construction works. Moreover, concerning the Mangaka-Tunduru road connecting with the Project at the end point, no concrete survey or design has been carried out; moreover, since no changes that could greatly impact the Project have occurred in the Mangaka city plans, work on the end point of the Project was advanced according to the original plan.

(3) Scope of Works on the Tanzanian Side

1) Transfer of Obstructions

As an obligation of the Tanzanian side, site survey was carried out on the obstructions that were confirmed in the basic design study and any new obstructions that may have arose after that. At the time of the basic design study, the only obstructions observe inside the road right of way (ROW) were a single house and well, however, there were no public utilities such as power lines, telephone lines and water pipes, etc., and this situation is the same today.

One well inside the ROW in Mangaka will need to be transferred for the road improvement works. This matter was notified to the Tanzanian side at the time of the basic design study. Since there is ample idle space to the rear of the existing well, the matter can be resolved by moving the well (offsetting by around 10 m) outside of the ROW.

The Tanzanian side is removing houses from the ROW along the Phase-2 section, where tree cutting and root removal work is currently being advanced. Moreover, on the Phase-3 section too, since the cost of removal is not great, the Tanzanian side is preparing to promptly conduct removal following signing of the E/N. T

2) Camp Yard Space

Camp yard space for the Project was provided by the Tanzanian side on the outskirts of Masasi in both the Phase-1 and Phase-2 works. In Phase-3 too, the current camp site is considered appropriate due to its relation to the stone quarry and so on.

3) Customs Clearance and Tax Exemptions

During the site surveys, hearings were conducted with the contractor to find out about customs clearance and tax exemption conditions relating to procurement based on experience during Phases 1 and 2.

As a result, the following problems were discovered relating to tax exemptions and customs clearance for equipment and materials necessary for implementing the Project under the grant aid scheme.

Tax Exemptions

Since the Tanzanian side uses a Government Notice (GN) on tax exemption for refunding taxes on products that are initially procured with tax included, it takes a lot of time to apply for and receive a refund. The tax refunds arising in the Project are

divided into a fuel tax refund and a value added tax (VAT) refund, and GN have been issued for both. Taking the instance of the Phase-1 works for the Project, the GN for VAT was announced in March while the GN for fuel tax was announced in July.

Concerning VAT, since GNs are only announced twice per year, even in the fastest cases it takes a few months to process tax refunds following procurement. In reality, since an even longer time is required, contractors are saddled with large interest payments due to the delay. Moreover, in addition to refund delays, the Tanzanian side (tax authorities, TRA) refuses to refund taxes paid by the GN on earlier fuel purchases, while only 65% of the total VAT refund due has been paid for reasons unknown. Accordingly, since contractors will need to delay procurement of fuel prior to the GN announcement in order to avoid such tax exemption difficulties, this will impact the works progress.

Upon asking about this point in a meeting with the TANROADS officials on April 28, 2009, the TANROADS side said that they were in negotiations with the TRA concerning the unpaid refund from the Phase-1 works.

Customs Clearance

The Project equipment and materials are imported through Dar es Salaam Port. However, Dar es Salaam Port is currently handling more freight than it can manage; in particular, many container carriers have to wait offshore before they can unload their cargoes. Accordingly, it is necessary to rely on loosely packed freight which is quicker to unload, however, since unloading areas become widely dispersed, customs clearance frequently takes a lot of time. Since there is little likelihood that handling functions will be improved at Dar es Salaam Port in the near future, it is necessary to adopt a procurement plan that provides ample allowance.

(4) Operation and Maintenance Capacity of the Implementing Agency

The government organization responsible for the Project is the MoID, while the implementing agency is TANROADS. TANROADS is currently endeavoring to strengthen its management of road maintenance work. In addition to maintenance works under financial assistance by the World Bank and the EU, assistance has been commenced by JICA and others for the enhancement of project management capabilities on a country- to- country basis. Progress is also being made in improving efficiency relating to contracts to be awarded for maintenance work, improving work supervision capabilities relating to work to be directly performed, and so on.

The following table shows the budget and actual financial performance of TANROADS in recent years. Revenue is obtained from the Road Fund, the MoID, donors and via the basket method. In particular, a uniform amount of funding is obtained from the Road Fund and provides an important source of funds for implementing road maintenance. The Road Fund is largely levied from users through gasoline tax and advertising fees for placing advertisements within road rights of way, and 70% of it is allocated to the Ministry of Infrastructure Development and TANROADS and 30% to local public authorities. Regarding development funds for road improvements and so forth, Tanzania is dependent on assistance from donors. The spending ratio with respect to budget amount is around 90%, indicating a need to improve the efficiency of budget implementation.

Table 2-1 Budget and Actual Financial Performance of TANROADS in the Past Three Years

('000 Tshs.)

| Item | | 2003/2004 | 2004/2005 | 2005/2006 | 2006/2007 | 2007/2008 |
|-------------|---|-------------------|--------------------|--------------------|--------------------|--------------------|
| Revenue | Road Fund allocation (development, maintenance) | 43,985,900 | 45,788,352 | 46,738,000 | 53,322,000 | 139,201,000 |
| | Allocation from Ministry of Infrastructure Development Bonds Fund (development) | 9,937,460 | 47,957,452 | 73,671,000 | 97,191,000 | 151,580,000 |
| | Funding from the Ministry of Public Works (salaries) | 3,794,442 | 3,946,220 | 4,409,000 | 5,782,000 | 5,595,000 |
| | Assistance from donors | 6,476,473 | 86,928,896 | 3,890,000 | 14,605,000 | 25,839,000 |
| | Basket method funds | 1,622,205 | 188,632 | - | - | 350,000 |
| | Others | 1,719,426 | 2,381,357 | 6,144,000 | 3,464,000 | 4,091,000 |
| | Total | 67,535,906 | 187,190,909 | 134,852,000 | 174,364,000 | 326,656,000 |
| Expenditure | Employee salaries | 4,256,225 | 4,848,051 | 4,553,000 | 6,617,000 | 6,746,000 |
| | General administration costs / execution control costs | 4,916,173 | 6,031,049 | 7,750,000 | 7,375,000 | 10,201,000 |
| | Maintenance works costs | 38,184,677 | 46,844,095 | 58,093,000 | 53,960,000 | 125,358,000 |
| | Development works costs | 13,303,657 | 101,487,329 | 57,135,000 | 103,682,000 | 156,896,000 |
| | Organizational strengthening costs | 1,605,808 | 1,148,494 | 1,184,000 | 1,385,000 | 1,991,000 |
| | Capital investment | 517,909 | 331,662 | 2,026,000 | 734,000 | 2,512,000 |
| | Total | 62,784,449 | 160,690,680 | 130,741,000 | 173,753,000 | 303,704,000 |

Note: The accounting year is from July to the following June.

TANROADS currently has an office in each region (21 offices) and four zonal offices to supervise the regional offices. The road between Masasi-Mangaka in the Project comes under the jurisdiction of the Mtwara Regional Office, which currently supervises the maintenance of trunk roads and regional roads in Mtwara Province and part of Ruvuma Province. According to the Mtwara Regional Office manager, the maintenance budget in 2007 was approximately \$1.2 billion each for trunk roads (including some trunk roads in Ruvuma Province) and regional roads.

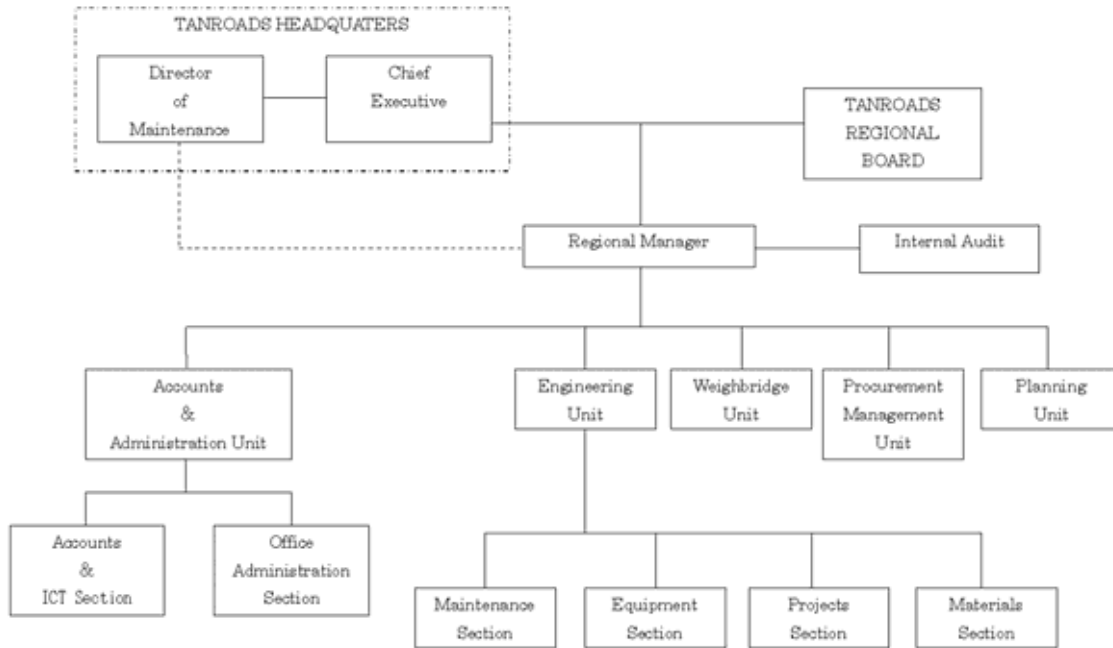


Figure 2-1 Organizational Chart of Mtwara Regional Office (TANROADS)

TANROADS, which is the implementing agency in the Project, and the MoID, which is the supervisory agency, are deemed to have sufficient organization and implementation capacity in consideration of past performance in the construction and maintenance of numerous roads. Accordingly, it is deemed that the organizational capacity of TANROADS and the MoID as well as the budget capability, technical capability and maintenance capacity following completion in Tanzania are at a satisfactory level.

- (5) Examination of a realistic and economical Project implementation schedule (implementation method), and renewed preparation of the execution plan.

Since there have been no major changes in external conditions caused by progress in associated plans on the target section, the implementation schedule and execution plan were reviewed and examined assuming a section scope of 22.5 km, comprising the 20.1 km that was planned in the basic design and the 2.4 km of road that had to be omitted from the Phase-2 works. Concerning the execution plan, ample consideration was given to 1) the increased length of road along the target section, 2) constraints on local procurement of aggregate and other materials, 3) procurement in remote areas, and 4) local conditions that were revealed in the Phase-1 works (rainy season, local operators, locally procurable equipment and materials, customs clearance, tax exemptions, etc.).

Accordingly, the execution plan was reviewed assuming a target section of 22.5 km and taking into account the anticipated implementation period, impact of the rainy season and changes in the procurement situation, etc.

(6) Rough Project Cost Estimation Issues

The biggest problem from the viewpoint of Project cost concerns the fact that many materials including the paving aggregate need to be transported over long distances, and poor road conditions over parts of the transportation routes will lead to expensive delivery costs. The road between Dar es Salaam and Mingoyo, which will be the transportation route for Project equipment and materials, is currently undergoing roadway improvement works over a 60 km section, however, problems still remain concerning passage during the rainy season and so on; moreover, since work has not yet been started on improving the temporary bridge between Mingoyo and Masasi, risk exists concerning materials transportation. Concerning aggregate, materials that satisfy the required specifications will need to be transported over distances of 70~100 km. Moreover, primary materials such as cement, reinforcing bars, and fuel, etc. and construction machinery such as bulldozers, etc. will need to be procured from Dar es Salaam some 600 km away or from overseas countries via Dar es Salaam Port. It will be necessary to estimate the Project cost upon taking such conditions fully into account.

(7) Construction Situation

1) Procurement routes of main equipment and materials

The main construction equipment and materials in the Project will need to be transported approximately 600 km overland from Dar es Salaam, or by sea to Mtwara Port and from there 200 km overland to the target area. Concerning road conditions for overland transportation, parts of the road from Dar es Salaam to Mingoyo are in atrocious condition, in particular a 60 km stretch around the midway point, and traffic impasses caused by rainfall and so on give rise to critical problems. It is forecast that full road improvements will not be completed before 2011. The current transportation time from Dar es Salaam to Masasi is approximately 10~12 hours for four-wheel-drive vehicles and two days for trucks transporting equipment and materials. As for the road from Mingoyo to Masasi, a bridge that was washed away by torrential rains in 1990-1991 has only been replaced with a temporary structure that has a stipulated passing load limit (20 tons). In the Project, the policy will be to examine the optimum works schedule upon taking the said conditions fully into account.

2) Procurement of aggregate materials for surface paving

Concerning procurement of surface aggregate for paving in the Project, since the rock formations situated over the Project section do not provide the required quality, it will be difficult to find good quality rock nearby. Accordingly, rock will need to be procured from the Chepite quarry some 60 km away (as originally planned), and this will lead to higher unit prices for crushed rock and aggregate. Moreover, since the stone crushing plant installed by TANROADS for producing aggregate is broken down and is unlikely to be repaired, it will be necessary to consider the procurement of a new stone crusher plant in the Project.



Candidate site for aggregate quarrying (Chepite)

3) Labor recruitment policy

Concerning labor recruitment, the employment of workers will be in line with the labor laws of Tanzania (Employment and Labour Relations Act, 2004). The labor standards law of the labor laws revised in 2004 includes regulations governing working hours, working conditions, social insurance, extra pay conditions, and so on. Further, while the said law stipulates that the number of working days shall be six days per week and shall not exceed 45 hours, private enterprise generally adopts a five-day workweek.

4) Construction material procurement policy

It is possible to procure the main types of constructions materials such as road aggregate, bitumen, cement, reinforcing bars, concrete aggregate, timber and fuel in Tanzania. However it will be difficult to locally procure reinforcing bars and so on. Considering assured procurement, quality and economic factors, such materials will be procured from third countries or Japan.

5) Construction equipment procurement policy

The Mtwara regional office of TANROADS possesses some construction machines that is leases out. However, since it currently only entrusts road construction and maintenance

management to local construction companies, there are no equipment available for hire to road construction works. Furthermore, there are no specialized rental / lease firms in Tanzania. However, since the individual construction companies that possess various items of construction machinery mutually borrow and lend equipment, a policy of local procurement was adopted. However, in cases where the availability of local construction equipment was insufficient to meet the schedule requirements, procurement of the necessary construction equipment from Japan was studied. Further, the policy regarding the procurement of special items was to carry out comparative cost studies on renting / leasing them locally versus importing them.

(8) Utilization of Local Contractors

All private construction firms in Tanzania permitted to undertake construction work are registered with the officially approved Contractors Registration Board (CRB). Registration is divided into that for locally capitalized firms and that for foreign capitalized firms and is classified into seven classes, namely 1 through 7, based on annual sales per category of work, construction equipment available, assets, and so on.

With regard to road construction work, it is considered that firms registered with the CRB as Class 1 (20 firms) and Class 2 (11 firms) in the civil division will be capable of working as subcontractors for Japanese contractors. As it is common practice among the construction firms concerned to mutually borrow and lend personnel and equipment, the policy will be to actively engage the services of Tanzanian construction firms.

2.2.2 Basic Plan

2.2.2.1 Overall Plan

(1) Scope and Scale of Facilities in the Project

The requested contents in the Project comprise the paving of two lanes of the existing unpaved road as well as the rehabilitation of transversal drainage structures and other auxiliary facilities. The necessity of realizing such contents was checked through field survey. Moreover, the length of the target section was confirmed to be approximately 22.5 km upon identifying the start and end points. The size of existing bridges and box culverts has been planned upon conducting hydrological study to ensure that the road doesn't become inundated. The following table shows the scope and size of facilities.

Table 2-2 Outlined design contents

| Design item | | Design contents |
|--|---|--|
| Length of the section covered by the Project | | Out of the total route (55.1 km) from Masasi to Mangaka, the 22.5 km section from the 32.6 km point to the end point in Mangaka. |
| Pavement structure | Surface course | Double bituminous surface treatment (DBST, main road, access roads, bus stops, etc.) |
| | | Single bituminous surface treatment (SBST, shoulders, entrances) |
| | Base | 15 cm base work (cement stabilization - main road, access roads, bus stops, etc.) |
| | | 20 cm subbase work (granular materials – main road, shoulders) |
| Design axle load | TLC3 (according to the Tanzania Highway Manual) | |
| Road width | Pavement width | 6.5 m (single side 3.25 m, 2 lanes) |
| | Shoulder width | 1.5 m, both sides |
| Improvements to bridges and crosswise traversing drainage structures | | 35 places (including 27 pipe culverts, 5 box culverts, and 3 bridges (each 30 m and 3 spans)) |
| Other auxiliary facilities | | Side ditches, retaining walls, bus stops, protective fences, signs, partition lines, etc. |

2.2.2.2 General Outline of the Basic Scheme

(1) Design Concept of Road Improvement

1) Design Criteria

As in the basic design, the design work for the Project was performed and reviewed mainly on the basis of the design standards of Tanzania (1989, Ministry of Public Works) and the South Africa Transport and Communications Committee (SATCC 1998), while other international standards such as the British Standard (BS) were referred to as required. The norms and standards that provide the basis for the above facilities design are indicated below.

Table 2-3 Norms and standards for design

| | Item | Standards, etc. applied for the Project | Reasons for application |
|---|--|--|--|
| 1 | Section covered by the Project | L = approx. 22.5km | Starting from the end point of Phase-2 (32.6 km from Masasi) and ending at the intersection at Nanyumbu government offices intersection (55.1 km from Masasi) just beyond the Mangaka intersection |
| 2 | Road classification | Regional trunk road | Classification by the Ministry of Infrastructure Development (MOID) |
| 3 | Applicable design standards for geometric design | In principle, the design standards of the MOW (1989) and SATTC (1998) shall apply. International standards such as BS, etc. as well as the Road Structure Ordinance of Japan shall be referred to. | Priority was given to the road design standards of the MOID. |
| 4 | Road alignment | A design speed of 80 km/h shall be taken as the basis. | According to judgment based on the results of field survey. |
| 5 | Road width | Roadway: 6.5 m; shoulder: 1.5 m | The road design standards of the MOID were taken into account. |
| 6 | Pavement structure Roadway / sidewalk / service road | The road specifications of the MOID shall apply. | The road design standards of the MOID were taken into account. |
| 7 | Improvements to crosswise traversing drainage structures | Live load B according to the specifications for highway bridges of Japan shall apply. (These cover the HA and HB load standards of the BS). | It is possible and convenient for design to cover the local standards by the standards of Japan. |
| 8 | Auxiliary structures | In principle, the design standards of the MOID (1989) and SATTC (1998) shall apply. | Priority was given to the road design standards of the MOID. |

2) Project Start and Finish Points

The Project starts at 32.6 km heading inland from the Nawala-Nachingwea Junction close to the center of Masasi district. This is the point reached as of the end of the Phase-2 works. As for the finish point, there is a right-turning road and intersection in the direction of Tunduru about 650 m away from the intersection where the Project road in Mangaka district joins with the connecting road to Unity Bridge, and this area contains a secondary school and 11 district government office buildings of Nanyumbu district. Accordingly, since



it is predicted that this point will become the central point of Mangaka district in future, examination was advanced assuming the junction with this right-turning road to be the end point (the same point as adopted in the basic design).

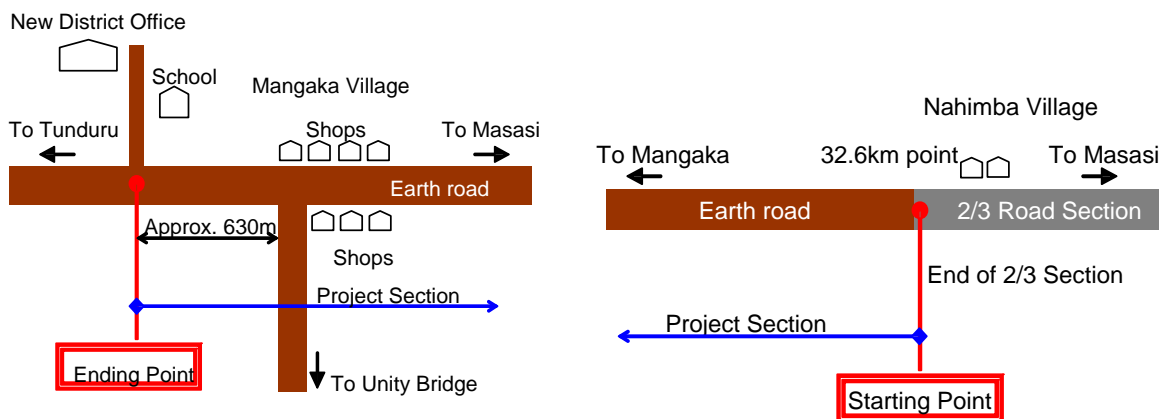


Figure 2-2 Start and End Points

3) Road Geometric Structure

Concerning the alignment of the existing road, there are two consecutive sharp curves, at points 40.5 km and 41.3 km from the start, (radius 50~60 m) where the minimum curve radius requirement on hilly parts of 230 m is not satisfied. Alignment improvement that conforms to criteria will be examined on these curves. As for the rest of the road, since the existing road alignment constitutes curves that satisfy reference values, the road alignment will basically be traced along the existing alignment. Accordingly, only very limited parts of the Project road greatly deviate from the existing ROW. Moreover, since the two sharp curve sections are surrounded by underbrush and there are no houses or farmland here, there will be no major relocation issues, etc.

Concerning the longitudinal alignment, gradient of the existing road is slightly steep towards the end of the Project route, however, even so the gradient here is only around 4~5%, so it falls within the scope of the design speed standard. Since other sections pass through gently sloping terrain, the basic policy shall be to trace the existing terrain as much as possible. Moreover, the longitudinal alignment shall be examined so that the grade difference with surrounding terrain doesn't become too large. However, concerning the basin of Mbangala River, which has a history of inundation damage, since it will be necessary to bank soil up to the design height derived from examination of structures assuming the flood level, the road here shall be raised approximately 1.5~2.0 m over the current height (the same as the policy adopted in the basic design).

4) Road Standard Cross Section

The standard cross section shall be examined upon taking into account the right of way of the target road (45 m), its function as a two-lane road, the positional relationship with roadside obstructions, and traffic safety. Since the target road forms part of a major trunk route expected to serve as a basic core route of the regional road network, the facilities plan was examined with a view to balancing these functions with the need to minimize cost. The gradient of slopes on cutting and banking sections shall be determined upon taking current conditions and soil conditions into account. Upon considering the soil conditions of the existing road, examination of gradient was examined as 1: 1.5 on cutting slopes and as 1: 20 on banking slopes. Width of the roadway, shoulders and sidewalks, etc. was examined as 6.0 m plus 1.5 m for shoulders (both sides), the same as in the basic design. The following figure shows the envisaged cross section of the road.

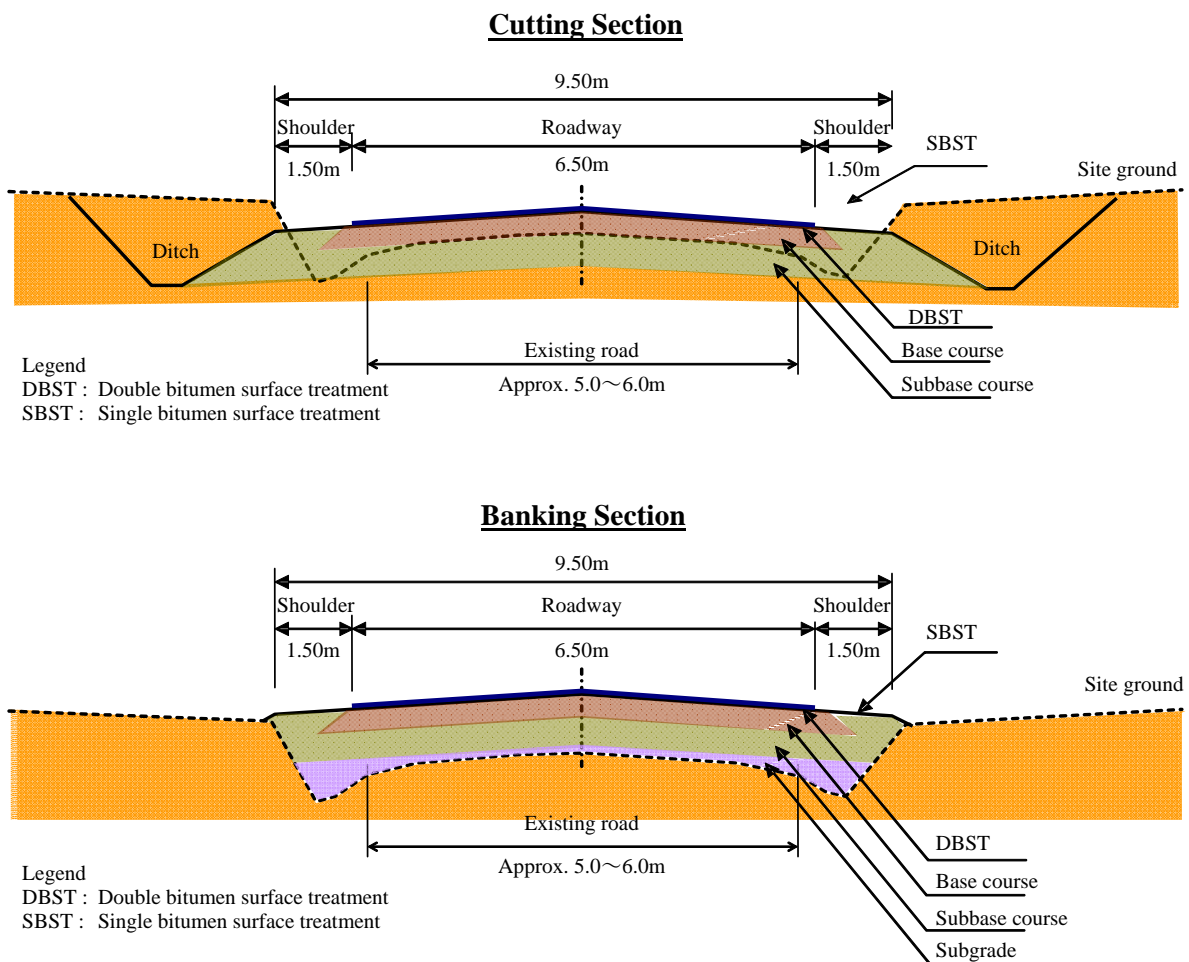


Figure 2-3 Road Standard Cross Section

The following table shows the design values adopted in the Project.

Table 2-4 Numerical design values employed in this Project.

| Description | | Units | Value (Rolling terrain) |
|------------------------------------|-----------------|-------|--|
| Design Speed | | Km/hr | 80 (65) |
| No. of Lanes | | No. | 2 |
| Right of Way Width | | m | 45 |
| Carriageway Width | | m | 6.5 |
| Shoulder width | | m | 1.5 |
| Cross Fall on | | % | Carriageway as 2.5, Shoulder as 4.0 |
| Minimum Radius of Horizontal Curve | | m | 230 |
| Maximum Gradient | | % | 5 (10) |
| Maximum Superelevation | | % | 8 |
| Minimum Sight Distance | | m | 140 (113) |
| Fill Slope | Granular soil | Angle | 1:1.5~2.0 (depend on soil type) |
| | Hard Rock | Angle | Hard Rock 1:0.5, Decomposed Rock 1:0.75 |
| Cut Slope | Other than Rock | Angle | 1:1.0~1.5 (depend on soil type) |
| | | | |
| Pavement Design Load | | - | TLC 3 |
| Structure Live Load | | - | Class B Load of Japan Road Association (More than HA, HB load of BS (as Tanzania Standard) |
| Seismic | | Kh | 0 |

Note : () = Minimum value

5) Intersection and Diversion Plan

① Main intersections

Intersections of the Project road with other main roads were examined upon considering the ease of maintenance, ease of connections with the existing road and so on. The following table gives a list of the major intersections.

Table 2-5 Major Intersections

| No. | Position | Section Distance | Uses |
|-----|----------------|------------------|---|
| 1 | 38.6 km | 35.1km | Nangonba district, intersection leading to Unity Bridge |
| 2 | 54.4 km | 15.8km | Mangaka district, intersection leading to Unity Bridge |
| 3 | Approx.55.1 km | 0.7km | End point, intersection leading to Nanyumbu government office buildings |

② Diversions

Concerning traffic control during execution of the works, judging from the current traffic volume, it should be possible to control traffic through enforcing single lane passage, etc. on the works sections. Moreover, even in cases where it becomes necessary to divert traffic during the works, it should be possible to establish diversions inside the existing ROW of 45 m.

6) Paving Plan

① General items

Paving structure in Tanzania is based on the combination of bituminous surface + base (granulated crushed stone or cement stabilization) + subbase (granulated material).

On the Project route, although sandstone hills are scattered around, it is difficult to find materials suited to this type of paving. Accordingly, the type and size of paving that enables the optimum cost balance, for example, base formation by cement stabilization that uses less aggregate, was examined taking into account conditions regarding the local procurement of materials.

② Type and structure of paving

Concerning traffic load conditions on the target section, in consideration of the traffic volume surveyed so far and the expected rate of increase in future, TLC 3 out of the Traffic Load Classes designated in the Pavement and Materials Design Manual in Tanzania is deemed appropriate on the Project section.

Moreover, because weather in the Masasi area is classified as moderate, when these conditions are applied to the said manual, the structure of double bituminous surface treatment + base + subbase is deemed appropriate, as in the case of the basic design.

Concerning the paving surface aggregate, since materials that satisfy the required specifications cannot be found on the target section, it will be necessary to procure from a site some 70 km away.

Concerning the base and subbase, since it is deemed possible to build the subbase through combining locally found materials with cement stabilization, the type and size of feasible paving that enables the optimum cost balance upon taking into account the conditions of procurement of these materials have been adopted.

Concerning the paving of shoulders, considering that there are numerous pedestrians and bicycle users, surface treatment and subbase treatment were examined.

③ Paving design

Taking into account the said current conditions, upon analyzing and examining the expected traffic load and bearing force of the existing road, the composition and

thickness of paving on the Project road were examined. The design conditions and paving composition and specifications are shown below.

Design conditions

Design axial load : TLC3
Subgrade bearing force : CBR10 or less

Road paving specifications

Surface layer : DBST (double bituminous surface treatment)
Base : 15 cm cement stabilization base
(local materials + cement stabilization)
Subbase : 20 cm granular materials (local materials)

Shoulder paving specifications

Surface layer : SBST (single bituminous surface treatment)
Subbase materials : Granular materials (local materials)

(2) Drainage Facilities Plan

1) General conditions

Road drainage facilities are intended to smoothly remove water from the road and surrounding area to ensure that people can safely and pleasantly use the road. At the same time, such facilities are very important in that they have a major impact on the service life of the road body and paving.

On the existing target road, because a lot of road maintenance entailing the cutting and shaping of the base ground has been implemented so far, rainwater that runs onto the road ends up flowing down the road course. Earth side ditches have been adopted to drain such water on some stretches, however, these are conversely thought to be a major factor exasperating road deterioration. Moreover, in the Mbangala river basin around the 35 km point of the route, there have been reports of the existing road becoming inundated after rain falls. Accordingly, it was decided to examine the optimum plan of drainage facilities based on consideration of the local conditions.

2) Outline of drainage conditions on the target section

Following figure shows the current drainage systems compiled based on the results of site surveys and topographical maps of the target section.

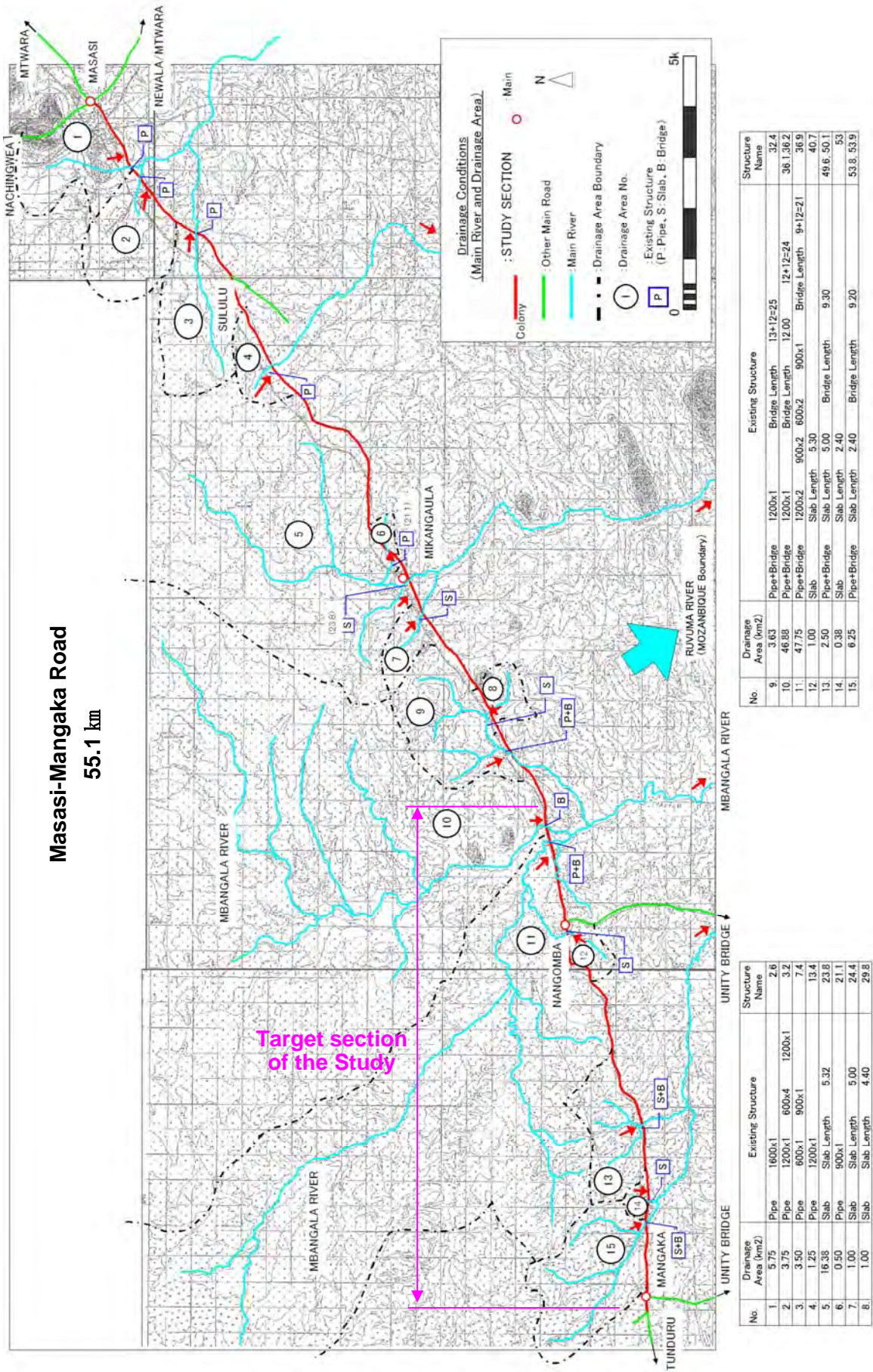


Figure 2-4 Current Drainage Systems

Outline of current drainage systems

Drainage systems over the target section can be summarized as follows.

- From the lowest point (altitude 250 m) at Mbangala River around the 35 km point, the road rises as it moves towards the start point (altitude 420 m) and terminal point (altitude 350 m).
- The total route between Masasi and Mangaka is divided into 15 catchment areas, while the target section of the Study comprises the 10th catchment area onwards. The overall direction of flow is towards the south (towards Ruvuma River on the border with Mozambique).
- Of these, catchment areas 8 to 12 belong to Mbangala River, which forms the largest river basin on the route, and these traverse the existing road. Concerning catchment areas 10 and 11 in particular, waters flowing down from the north side of the road have caused inundation in the past.

3) Current condition of transversal facilities and outline of rehabilitation methods

3-1) Existing transversal drainage facilities

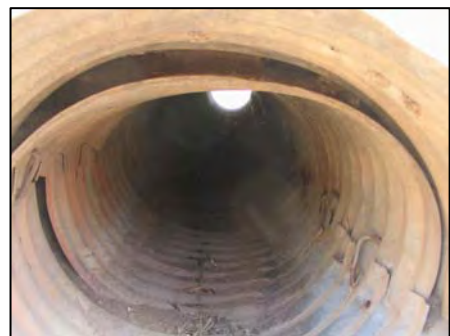
There are 35 transversal facilities consisting of pipe culverts, box culverts and bridges on the 22.5 km target section. Of these, corrugated metal pipes and bridges are in particularly bad condition, while the installed length of other structures is too short to secure the required width of the Project road. Accordingly, these facilities cannot be used as they are. Judging from the state of facilities, it is judged that the corrugated metal pipes were installed at the same time, and main structures are deformed in numerous places due to problems in the original installation work.

3-2) Problems according to type of structures

Pipe and box culverts

The structure of existing corrugated metal pipes is such that strength as pipe differs greatly depending on the degree of bolt tightening when the different parts are joined during assembly.

In the existing corrugated metal pipes, serious problems have been confirmed in the actual pipe structures, for example, the number of tightening bolts has been pared down or reinforcing bars have been bent in order to fill the role of bolts. Moreover, because sufficient soil covering has not been secured between the pipes and



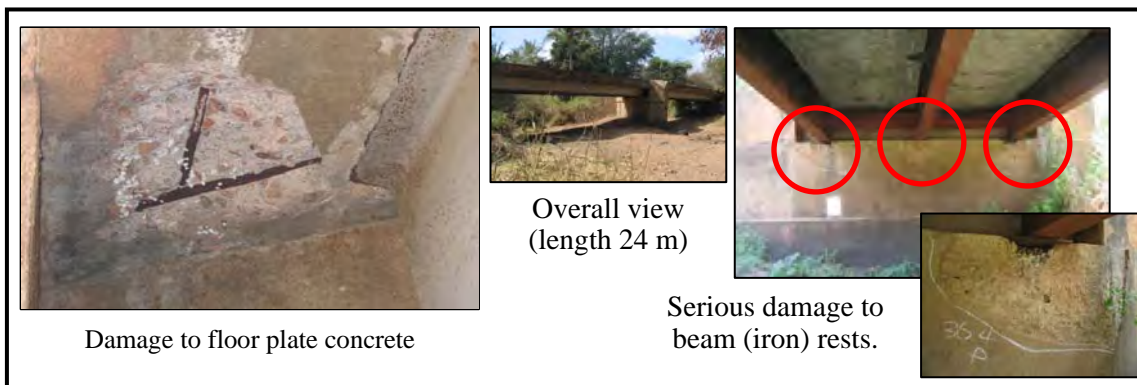
surface of roads, the pipes have been constantly subjected to direct traffic loads, which in turn have caused deformation and other problems.

The existing concrete pipes consist of relatively old pipes that were installed before and after the said corrugated pipes, and new pipes that have been installed in maintenance activities by TANROADS. The old pipes have problems in terms of the pipe bodies and the state of installation, while earth covering is thought to be insufficient for both the new and old pipes.

Existing box culverts are divided into two types, i.e. stone sidewalls with concrete slabs on top, and concrete sidewalls with concrete slabs on top. Both types have problems: the stone sidewall box culverts are generally deteriorated, whereas the concrete sidewall types have warped floor plates and so on.

Bridges

There are currently three bridges of the composite type (H-shaped steel and concrete floor plates). All the bridges are too narrow to allow two-way traffic, i.e. they are 3.5~5.4 m in width, and all of them are in badly deteriorated condition characterized by damaged concrete floor plates, omission of pedestals under main beams, and cracking of joints between beams, abutments and piers, etc.



State of Damage in Bridges

3-3) Examination of rehabilitation methods

Pipe and box culverts

It has been decided to replace all the existing corrugated metal pipe culverts in view of their critical structural damage. Furthermore, concerning the existing concrete pipe culverts and box culverts, the soundness and state of structures were confirmed and examination was conducted with a view to fully utilizing the existing structures that can be used by extending their ends. However, since it was confirmed that utilizing the existing structures in the Project is difficult, it was decided to replace them.

Bridges

In view of the poor state of existing bridges, examination of rehabilitation was advanced upon confirming the flow of water at each bridge position and considering the possibility of replacing with box culverts. In Tanzania, the British Standard (BS HA and HB loads) is applied to the design of such structures, however, since it is considered that the design of structures in the Project fully satisfies these standards, we explained to the TANROADS side our intention to apply the Japanese design B load standard and obtained its consent.

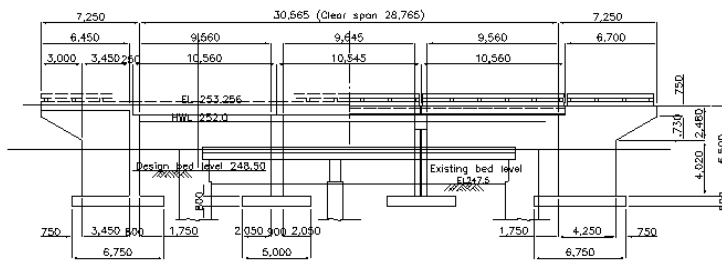
The existing bridges consist of steel crossbeams and concrete floor plates. Even the largest bridges have only two spans and are around 20 m in length, while the road width on all bridges is around 3.5~5.4 m and only sufficient for one-way traffic. Land around bridges was inundated during high waters in the past (1990 and 1997).

The section where there are consecutive two-span bridges corresponds to the flow channel of Mbangala River (around the 35 km point), which comprises a relatively large basin. The flow channel of the river cannot be pinpointed even around these bridges. Moreover, because the interviews with TANROADS officials and local residents revealed that the road here was inundated to depths of approximately 30~40 cm during the flooding that struck the coast of Tanzania in 1990 and 1997, examination was conducted with ample consideration given to the design height of the road and cross-sectional area of flow. As a result, upon also taking into account the pier height of new bridges, it was concluded that the existing road needs to be raised by around 1.5~2.5 m on this section. As for the bridge structure, superstructure comprising three 10 m spans of RC simply supported girders, and substructure of spread foundations were adopted.

The following table shows an outline of results based on examining rehabilitation of culverts and bridges in the Project.

Table 2-6 Transversal Structures Plan

| Item | Existing | Project | | | Remarks | |
|---------------|----------|---------|---------------|-------|---------|---|
| | Sites | Sites | Size and Type | Qty | | |
| Pipe culverts | 28 | 28 | D900mm | 1Cell | 17 | Replace existing corrugated pipe with concrete pipes. |
| | | | | 2Cell | 7 | |
| | | | | 3Cell | 0 | |
| | | | | 4Cell | 4 | |
| Box culverts | 6 | 6 | 4x3m | 1Cell | 2 | Replace existing culverts. |
| | | | 5x4m | 1Cell | 1 | |
| | | | | 2Cell | 2 | |
| | | | | 4Cell | 1 | |
| Bridge | 3 | 3 | 10m | 3Span | 3 | Rebuilding existing bridges. |
| Total | 37 | | | | 37 | |



| Site | Structure | Length of Bridge |
|--------|-----------|------------------|
| 34.7km | RC | 10+10+10=30m |
| 34.9km | RC | 10+10+10=30m |
| 35.3km | RC | 10+10+10=30m |

Figure 2-5 Project Bridges

Inlets and outlets

In order to ensure the constant passage of river water and prevent scouring of the riverbed and slopes, transversal drainage structures were designed with inlets installed on the upstream side and outlets on the downstream side. As for the structure of inlets and outlets, concrete standing walls and floors were adopted.

4) Road side ditches

It has been decided to adopt a combination of earth ditches and stone masonry ditches for roadside ditches. Concerning the stone masonry ditches, it has been planned to build a total of approximately 8,700 m on both sides of the road in the areas where there is risk of scouring.

(3) Traffic Safety Facilities Plan

1) Road lines and road signs

Centerlines and sidelines have been planned over the whole length of the target road. Furthermore, pedestrian crossing lines have been planned in the necessary areas. Concerning road signs, the necessary points have been narrowed down and the types of signs examined.

2) Protective fence

The equipment required for traffic safety on the target road section shall be installed as follows:

Guardrails : before and after major structures where height difference with the road exceeds the safe limit.

Guard posts : sections before and after guardrails

3) Kilometer posts

Considering the status of the target road as a regional trunk road and from the viewpoint of utilizing for road maintenance, kilometer posts shall be installed at set intervals.

4) Bus stops

Trunk roads in Tanzania have spaces for buses and so on to stop in roadside communities. Bus users and truck drivers, etc. use these spaces as rest spaces in order to purchase drinks and souvenirs, etc. Since it is forecast that the number of passengers traveling between regions will increase in the future, it is planned to install bus stops of the type shown below (length 18.0 m, width 4.0 m + run-off area, DBST paving) in nine communities on the target route in the Project.

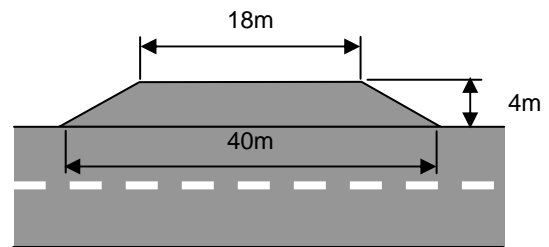


Figure 2-6 Bus Stops Plan

2.2.3 Outline Design Drawings

The following table gives an outline of the basic design drawings that have been prepared based on the above basic plan.

Moreover, related drawings are given in the appendices.

Table 2-7 List of Basic Design Drawings

| Drawing No. | Contents of Drawings | Number of Sheets |
|-------------|--|------------------|
| A-1~D-1 | Location maps, Road standard cross sections | 6 |
| E-0~E23 | Road top views and longitudinal sections | 24 |
| F-1~F-17 | Standard drawings of drainage structures | 17 |
| G-1~G-5 | Drawings of auxiliary related facilities and safety facilities | 5 |

2.2.4 Implementation Plan

2.2.4.1 Implementation Policy

This Project will be implemented under the framework of grant aid by Japan so that the following points have to be taken into consideration as a guideline for execution.

- Local engineers, workers and materials shall be utilized as much as possible for contribution to employment creation, promotion of technology transfer and vitalization of local economy.
- A close communication system shall be established between the Tanzanian government, the consultant and the contractors so as to smoothly implement the Project.
- A plan shall be formulated assuming efficient materials delivery and equipment operation. The local topographic and geological features, etc. shall be adequately grasped and reflected in the temporary work plan.
- A realistic execution scheme shall be formulated in consideration of rainfall patterns, time requirement for equipment and materials procurement, proper working methods, etc.
- Proper schedule for detour and time schedule of construction shall be drawn up in order to avoid any excessive hindrance to current traffic flow.

2.2.4.2 Implementation Conditions

The following points shall be considered in the term of implementation of the Project:

(1) Observance of labor standards

The contractor shall observe the presently applicable laws and regulations of Tanzania concerning construction, pay serious attention to appropriate working conditions and practices in relation to employment, prevent any dispute with workers and secure safety.

(2) Environmental conservation during the construction period

The contractor shall conduct and supervise the construction works while paying attention to the environmental requirements. In addition, the contractor shall take care of environmental preservation by taking measures against dust, turbid water, etc. which may arise out of waste disposal, surplus soil disposal, filling, paving, etc. in relation to removal of the existing structures (longitudinal and crosswise traversing drainage structures).

(3) Necessity of communicating means on the site

A communications setup based on use of cellular phones shall be secured along the Project route, and a safety management setup shall be established ensuring the safety of traffic, roadside residents and works personnel during works and at times of emergencies.

(4) Respect for local customs

A construction time schedule in accordance with the local religious customs and daily habits shall be considered in the term of formulating the execution scheme.

(5) Securing of traffic safety

Examination was conducted on the assignment of safety equipment (barricades and color cones, etc.) and traffic controllers and installation of information boards and notices, etc. during the road works.

(6) Circumstances around customs clearance

Imported equipment and materials in Tanzania are usually landed at Dar es Salaam Port. However, since Dar es Salaam Port is currently handling more freight than it can manage, customs clearance frequently takes a lot of time. Since there is little likelihood that handling functions will be improved at Dar es Salaam Port in the near future, it is necessary to adopt a procurement plan that provides ample allowance.

(7) Procurement of land for construction work

It shall be confirmed that pre-agreement for land use and payment of guarantee money, etc. will properly be undertaken by the Tanzanian government.

(8) Coordination of construction time schedule with others

Progress of works on the Tanzanian side shall sufficiently be verified for coordination.

2.2.4.3 Scope of Works

The scope of performance of Japan and that of the Tanzanian government are described below.

(1) Scope of work by Japan

1) Construction work

Paving and improvements to transversal drainage structures over the target road length of 22.5 km;

- Road construction including earth works, subbase course and surface works, and the necessary incidental temporary works;
- Installation of drainage structures and auxiliary facilities, and the necessary incidental temporary works;
- Installation of temporary facilities (base camp, office, storage, etc.).

2) Procurement of equipment and materials

Procurement of construction materials and equipment for construction of the road and structures described in 2.2.4.6 “Procurement Plan”.

3) Safety measures

Safety management and measures concerning execution of the construction works.

4) Consulting service

Drawing up of tender and contract documents, assistance for bidding and works supervision as described in 2.2.4.4 “Consultant Supervision”.

(2) Scope of work by Tanzania

1) Acquisition of permission for construction works

Acquisition of permission for the construction works concerning the Project by TANROADS before bidding by contractors.

2) Customs clearance and procedure for tax exemptions

Provision of conveniences and prompt implementation to facilitate customs clearance and tax exemption of imported equipment and materials at the Tanzanian port prior to commencement of the construction works.

3) Expropriation of land and compensation

Insurance of the land necessary for facilities such as base camp, etc. given in the “Work execution plan” as well as of the place for disposal of wastes and surplus soil.

4) Support to facilitate relocation of public facilities, etc.

- Relocation of obstructing facilities (telephone cables, electric cables, sewer pipes, wells);
- Securing of camp yards (temporary buildings, crushed stone plant yards)

- Provision of rock and earth quarries necessary for the works, and disposal sites for waste materials arising from the removal of existing bridges; and
- Assignment of supervisory staff to TANROADS and securing of an office, means of transport and expenses for them.

5) Others

- Support to facilitate immigration and stay, etc. of the Japanese and people from any third country (other than Tanzanian people) engaged in implementation of the Project;
- Exemption or refunding of customs, domestic taxes and other tax surcharges, etc. imposed by the Tanzanian government;
- Appointment of counterpart as well as securing of means of transport and expenses for the personnel.
- Cost arising from registration of local contractors in the Project.

2.2.4.4 Consultant Supervision

(1) Procedure for implementation of consulting service

Conclusion of the exchange of notes (E/N and G/A) concerning grant aid for the Project between the governments of Japan and Tanzania forms the precondition for implementation of the Project. After conclusion of the E/N, the consultant shall conclude a consultancy agreement with TANROADS as the implementation organ on Tanzanian side according to the scope and procedure of the grant aid by Japan on the basis of the letter of recommendation by JICA to proceed with execution design, assistance for bidding and execution control. Following the signing of the agreement, the tender assistance work and works supervision shall be conducted. The principal contents of service to be contained in the consultancy agreement are described below.

1) Stage of drawing up tender documents

According to the results of the study report, the tender documents shall be prepared and approval for them obtained from TANROADS.

2) Tender stage

TANROADS will select a contractor of Japanese nationality by open bidding with assistance by the consultant. The representatives of the Tanzanian government participating the bidding and conclusion of construction contract will have to own the authority for contract approval and to be capable of making judgment on technological matters. The assistant services by the consultant in the tender stage shall be as follows:

- ① Announcement of tender, ② Pre-qualification, ③ Bidding and evaluation of tenders,
- ④ Contract conclusion.

(2) Organization for implementation

Assignment of consulting staff and their duties in each stage of the tender shall be as follows:

1) Preparation of tender documents

A design team organized under the controller shall prepare the tender documents. In consideration that this Project is based on the grant aid by Japan, attention shall be paid to the following:

- The forms for instruction to bidders and for contract shall be in accordance with the guideline for grant aid of Japan.
- The technical specifications shall be prepared with the main aim of ensuring sufficient quality while referring to the technical specifications on the Tanzanian side.
- Persons who are acquainted with the design contents with relation to the study on basic design and the execution design shall play a key role in preparation of the tender documents.

2) Organization for implementation of bidding assistance

A person in charge shall be dispatched for accomplishment of the smooth tendering (preparation of tender document, tender announcement, tendering, tender evaluation, etc.).

3) Organization for execution control (organization for site control by the consultant)

After contract conclusion with the contractor, the consultant shall issue the notice to commence to him and proceed with execution control. Within the framework of execution control, the consultant shall directly report to TANROADS about the progress of construction, control the progress, quality and safety of the contractor's work, manages payment to him and make proposal for betterment of the construction works, etc. Furthermore, the consultant shall make monthly report to the Japanese Embassy in Tanzania and the Tanzanian office of JICA. One year after completion of execution control, the consultant shall perform inspection of the completed construction works to terminate his consulting service. The period of dispatch shall be 18 months from the preparation of tender documents till the completion of works.

2.2.4.5 Quality Control Plan

The contractor shall establish a quality control laboratory in the camp yard. For this, the minimum necessary equipment for implementing quality tests on road soil, paving and concrete shall be procured from Japan. As for the staffing plan, one locally recruited laboratory technician shall supervise all testing and will be supported by two assistants.

However, tests that can be implemented at local public test facilities shall be consigned. Table 2-8 shows the main quality control plan for the Project construction works.

Table 2-8 Items of quality management

| Description | | Test method | Examination frequency | |
|--------------------------------|-----------------------------------|--|---|----------------------------|
| Base / Sub-base | Combination (mixed) materials | Liquid limit / Plasticity limit | For each mix | |
| | | Sieve test | | |
| | | Strength test for aggregates | | |
| | Density test for aggregates | | | |
| | Laying | Maximum drying density (compaction test) | Once / day | |
| Prime coat Asphalt emulsion | Materials | Bitumen materials | For each materials | |
| | | | Temperature at the time of keeping / spreading | For each delivery |
| Asphalt | Materials | Bitumen materials | For each materials | |
| | | Aggregate | Sieve test | For each mix, Once / month |
| | | | Water absorption rate | For each materials |
| | | | Strength test for aggregate | |
| Concrete | Materials | Cement | For each materials | |
| | | Water | Ingredient test result | |
| | | Additive agent | Certificate of quality, Ingredient analysis list | |
| | | Fine aggregate | Absolutely dry specific gravity | |
| | | | Sieve test | |
| | | | Silt mixture rate for clayey and silty materials | |
| | | Course aggregate | Absolutely dry specific gravity | |
| | Grain size distribution (Mixture) | | | |
| | Cement mix | Test piece | Compressive strength test | For each mix |
| | Foundation | | Slump (concrete) | For each materials |
| | | | Air contents | |
| | | | Temperature | |
| | Strength | | Compressive strength test (7 th day, 28 th day) | For each foundation |
| Reinforcement bar | Materials | Certificate of quality, Tension strength test result | For each lot unit | |

2.2.4.6 Procurement Plan

(1) Circumstances around procurement of equipment and materials for construction

The field surveys revealed that general works materials (bitumen, cement, aggregate and timber, etc.) are either produced in Tanzania or are imported and can be purchased on the local market. However, the expansion devices and rubber supports, etc. used in bridges cannot be procured locally.

Table 2-9 shows the procurement sources of the main materials.

Table 2-9 Procurement Sources of Main Materials

| Material | Procurement Source | | Remarks |
|--|--------------------|-------|---|
| | Tanzania | Japan | |
| [General materials] | | | |
| Bitumen | ● | | |
| Cement | ● | | |
| Paving aggregate | ● | | Manufacture in the stone crushing plant |
| Reinforcing bars | ● | | |
| Concrete aggregate | ● | | Manufacture in the stone crushing plant |
| Macadam | ● | | Manufacture in the stone crushing plant |
| Timber (plywood, square timber, planks) | ● | | |
| Fuel | ● | | |
| Oils | ● | | |
| Paint | ● | | |
| Shaped steel, steel pipes | ● | | |
| [Bridge construction materials] | | | |
| Expansion devices | | ● | |
| Rubber supports | | ● | |

Concerning the crushed stone and concrete aggregate required for the Project, as was envisaged in the basic design, this can be obtained from the TANROADS quarry at Chepite, which is approximately 70 km along the coast from Masasi town. A stone crushing plant will be required to produce aggregate of the designated grain size for use in the works from the quarried stone blocks, however, the TANROADS crusher plant currently installed at the quarry is currently out of order and is unlikely to be repaired in the near future. Moreover, although numerous rock formations (sandstone) exist around the Project route, this rock is not suitable for use as paving surface aggregate or concrete aggregate. Therefore, in the Project, a stone crusher plant shall be procured to manufacture aggregate from raw materials obtained from the Chepite quarry.

(2) Works Equipment

Except for special machines, it is possible to lease road construction machines owned by local subcontractors, however, since the available machines do not have sufficient capacity and are in a poor state of maintenance, many cannot be leased for the purpose of the Project. Considering that the works are executed over a limited period, the procurement sources of the main construction machinery were planned as shown in the following table.

Table 2-10 Procurement Sources of Main Construction Machinery

| Equipment | Specifications | Source | | | Reason | |
|--------------------------------------|---|----------|-------|---------------|--|--|
| | | Tanzania | Japan | Third Country | | |
| Bulldozer | Normal 3t type | ● | | | Lease from local contractors is possible. | |
| Bulldozer | Normal 21t type | | ● | | Procure from Japan, because locally available equipment is badly deteriorated. | |
| Back hoe | Crawler type, 0.28m ³ piling | ● | | | Lease from local contractors is possible. | |
| Back hoe | Crawler type, 0.45m ³ piling | | | | Procure from Japan, because locally available equipment is badly deteriorated. | |
| Back hoe | Crawler type, 0.8m ³ piling | | ● | | | |
| Wheel loader | Normal type, 2.1m ³ piling | | ● | | | |
| Truck crane | Hydraulic telescopic jib 16t | | ● | | | |
| Rough terrain crane | Hydraulic telescopic jib 25t | | ● | | | |
| Large breaker (independent) | Hydraulic type, 1,300kg | | ● | | | |
| Crawler drill | Hydraulic loaded type, 150kg | | ● | | | |
| Motor grader | Blade width 3.1m | | ● | | | |
| Stabilizer | For roadbed improvement, mix width 2.0m, depth 0.6m | | ● | | | Procure from Japan, because local equipment is badly deteriorated. |
| Road roller | Macadam 10~12t | | ● | | | Procure from Japan, because local equipment is badly deteriorated. |
| Tire roller | 8~20t | | ● | | | |
| Concrete plant | Forced mixing type, capacity 30m ³ /hr | | ● | | Procure from Japan, because local procurement is unfeasible. | |
| Truck mixer | Mixing capacity 3.0~3.2m ³ | | ● | | | |
| Asphalt kettle | Stationary type, tank capacity 6,000ℓ | | ● | | Procure from Japan, because locally available equipment is badly deteriorated. | |
| Asphalt distributor | Self-running type, tank capacity 6,000ℓ | | ● | | | |
| Chip spreader | Hopper capacity 0.4m ³ | | ● | | Procure from Japan, because local procurement is unfeasible. | |
| Water sprinkler (water supply) truck | Tank capacity 5,500~6,500ℓ | | ● | | Procure from Japan, because locally available equipment is badly deteriorated. | |
| Aggregate plant | Manufacturing capacity 90ton/hr | | ● | | Procure from Japan, because local procurement is unfeasible. | |
| Dump truck | Normal diesel, 4t&10t loading | ● | | | Lease from local contractors is possible. | |
| Truck with crane | 6t loading, 2.9t suspending | ● | | | | |
| Semi trailer | 25t, 32t loading | ● | | | | |
| Vibrating roller | Hand guide type 0.8~1.1t | ● | | | | |
| Vibrating roller | Mounted combined type 3~4t | ● | | | | |
| Tamper, vibrating compactor | 60~80kg, 40~60kg | ● | | | | |
| Surface cleaning truck | Vacuum rear dump type | ● | | | | |
| Motor generator | Rated capacity 20KvA-300KvA | ● | | | | |

(3) Compilation of the Transport and Packing Plan

1) Conditions at the Landing Port

The Project equipment and materials are imported through Dar es Salaam Port. However, since Dar es Salaam Port is currently handling more freight than it can manage, customs clearance frequently takes a lot of time. Since there is little likelihood that handling functions will be improved at Dar es Salaam Port in the near future, it will be necessary to adopt a procurement plan that provides ample allowance. Concerning the time required for customs clearance of goods landed at the port, according to a hearing survey of contractors in Phase-1 and Phase-2, it was found that the time has recently been shortened from two months to around one month.

2) Inland Transportation Route

The main construction equipment and materials in the Project will need to be transported overland from Dar es Salaam. Parts of the road from Dar es Salaam are in atrocious condition, in particular a 60 km stretch around the 160 km point, and traffic impasses causes by rainfall and so on give rise to extreme difficulties. Currently, dirt road improvement works have been started on this section under financing from the Tanzanian government and OPEC. Works have been started on removing vegetation and roots, banking the road foundations and installing drainage structures (culverts), however, judging from the current state of progress, the road improvements on this section are unlikely to be finished in time for Project implementation. Accordingly, although the impact on Project procurement will be somewhat reduced, the equipment and materials transport environment will not be totally remedied, and this will need to be taken into consideration in the execution plan.

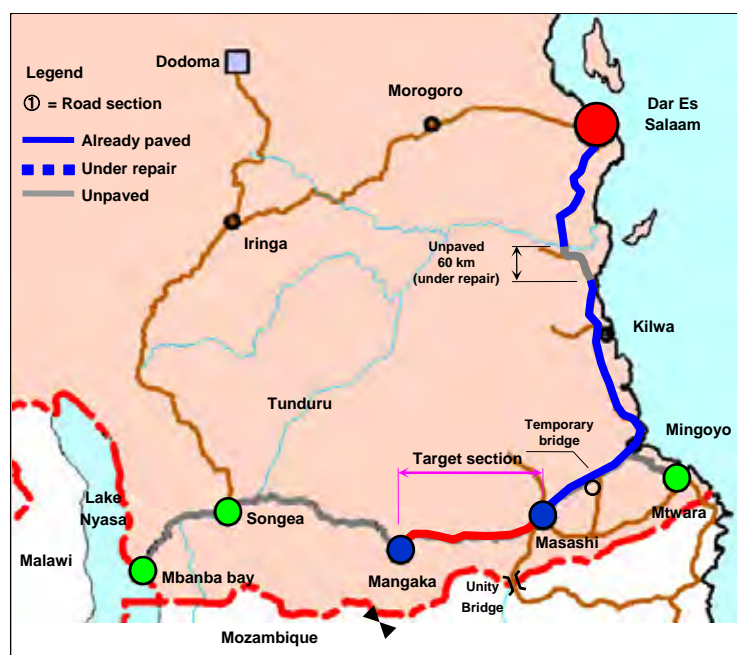


Figure 2-7 Map of the Port of Landing and Transportation Route

3) Transportation Lead Time

Since uncertain elements exist concerning the landing time after marine transportation and conditions on the overland transportation route, the lead time for transportation from Japan to the Project site has been set at three months including some allowance (see Setting of Transportation Lead Time for details). In the basic design, the possibility of using Mtwara Port was considered, however, since China, which is building Unity Bridge under similar conditions to the Project, does not use this port, it was deemed to be currently unfit for use.

Setting of Transportation Lead Time

Assuming transportation from Japan, the time required from loading to arrival on site was set at 90 days (3 months) as shown below.

- Port in Japan $\xrightarrow{\text{Marine transport}}$ Dar es Salaam Port : 50 days
 - Landing ~ customs clearance : 35 days
 - Dar es Salaam Port $\xrightarrow[\text{(approx. 600 km)}]{\text{Overland transportation}}$ Camp yard : 5 days
- 90 days

- Note) 1. The days required for marine transportation were obtained based on hearing surveys with transporters.
2. The days required from landing to customs clearance were obtained based on hearing surveys with contractors in Phases 1 and 2.

2.2.4.7 Implementation Schedule

(1) Setting of the Works Period

Considering the diversity and scale of works in the Project, execution plans and works schedules shall be separately compiled and examined for the road works and the transversal structural works, and the execution schedule and overall works plan shall be compiled upon considering the execution divisions (sections) and connections at the time of execution.

- 1) Since major equipment and materials will be imported from Dar es Salaam, it will be necessary to consider road conditions over the transportation route of approximately 600 km and include time necessary for long-distance haulage.
- 2) Limitations exist concerning possible works quantities and road conditions for carrying in equipment and materials during the rainy season.
- 3) It is necessary to include time necessary for implementing ground improvement on both sides of the road on sections of soft soil such as black cotton soil and so on.

2.3.2 Specific Requirements for This Project

The items undertaken by the Tanzanian side that are specific to this project and not included in the general requirements are as follows.

(1) Relocation of obstacles

Some houses exist within the ROW (22.5 m either side of the existing road centerline, i.e. 45 m in total) in communities and in suburban parts of Mangaka along the route, however, TANROADS has already notified the owners of its plans to remove the buildings. Also, a well has been confirmed close to the road in Mangaka, and although it will only cost around 500,000 yen to remove, this cost will need to be added to the costs on the Tanzanian side.

Table 2-12 List of Obstacles

| Obstacle | Related Agency | Address | TEL | Relocation Cost Estimate (mill. T.Shs) |
|----------------------------|---------------------------------------|----------------------|-------------|--|
| Well | Water Department, Masasi D.C. (Rural) | P.O.Box113 Masasi | 0745-516544 | 5 |
| Note:D.C.=District Council | | | Total | 5 |

(2) Relocation in consideration of socio-environmental issues

The Government of Tanzania will need to shoulder the following relocation costs to ensure socio-environmental consideration

Houses that exist within the ROW have received advance notification from TANROADS that they will be targeted for relocation (a red 'X' mark is painted on the building walls). Once Project implementation is finally decided, it will be necessary to give final notification and take relocation procedures, and this will need to be implemented before the start of the works.

Table 2-13 Cost Estimate for Relocation

| Item of relocation | Estimated cost (Tshs) | Remarks |
|--------------------|----------------------------|------------------------|
| Houses | 7 million yen (70 million) | Estimate by Study Team |
| Total | 7 million yen (70 million) | |

(3) Land acquisition cost

In line with curve improvements at two points around the 41 km point, expropriation of land will be needed. However, since there are no buildings, etc. in the target section, there will be no relocation.

(4) Responsibility for securing temporary construction yard

Construction yard for contractors will be required as follows.

- Size of construction yard: Base camp and plant yard (150 m x 200 m)
- Duration of use: 1.5 years

(5) Construction operator (CRB and ERB) registration costs

When construction operators and consultants in Tanzania need to register with local construction company associations, the following registration expenses are borne by the Tanzanian government in recent years.

Table 2-14 Construction Operator Registration Expenses

| Item | Cost | Remarks |
|------------------|----------|----------------------------------|
| Registration fee | \$7,000 | |
| Annual dues | \$20,000 | \$10,000 per year, for 1.5 years |
| Total | \$27,000 | |

2.4 Project Operation Plan

The following maintenance work for the facilities will be required during the operational stage after the completion of the Project.

(1) Regular maintenance work

The maintenance such as repair work regularly required throughout the year, especially after the rainy season, is listed below.

- Patching up the damaged road surface (filling potholes)
- Repairing the subbase as required
- Reshaping the road shoulders

Moreover, constant and regular repair and cleaning of roadside gutters, slopes and transversal drainage structures will be required.

(2) Periodic maintenance work

- Repair of subbase
- Repair of road shoulders
- Repair of structures

TANROADS Mtwara Regional Office currently contracts out the above maintenance work to local contractors and no operational problems are found. In particular, since it is important to

repair damaged parts immediately, the local side will be expected to conduct regular rounds of inspection at sufficient intervals for early detection.

2.5 Project Cost Estimation

2.5.1 Initial Cost Estimation

This cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant.

(1) Cost shouldered by the Tanzanian side

The cost for the Tanzanian side is estimated to be 120 million Tshs (approximately 12 million yen) for relocation of obstacles, relocation of facilities for socio-environmental consideration, land acquisition, securing temporary construction yard, AP issue and CRB and ERB expenses, etc.

- ① Well relocation: 5 million Tsha (0.5 million yen)
- ② House relocation: 70 million Tshs (7 million yen)
- ③ Contractor registration: 30 million Tshs (3 million yen)
- ④ AP expenses: 15 million Tshs (1.5 million yen)

Total: 120 million Tshs (12 million yen)

(2) Conditions for cost estimation

1) Foreign exchange rate

1 US dollar =95.77 Japanese yen (as of the end of May 2009)

2) Duration of construction

Dividing the works into single fiscal years, the time required to implement tender assistance and construction works will be 18 months as shown in the implementation schedule.

3) Other conditions

- This project is implemented in accordance with the grant aid scheme of the government of Japan
- The exchange rate above is subject to change by the Government of Japan

2.5.2 Operation and Maintenance Cost

The operation and maintenance cost estimated based on the operation and maintenance plan described earlier is shown below.

Table 2-15 Major O/M items and cost

(ITS = 0.1 yen)

| O/M Type | Frequency | O/M item | Specifications | Unit | Unit cost | Unit work amount | Number of work | Cost |
|---|------------|--------------------------|----------------------------|----------------|-----------|------------------|----------------|---------------|
| Cumulative | Every year | Patching | 2% of the total paved area | m ² | 17,200 | 2,925 | 8 | 402,480,000 |
| | | Roadbed repair | 2% of the total paved area | m ² | 13,800 | 2,925 | 8 | 322,920,000 |
| | | Road shoulder repair | 2% of the total road | m ² | 10,500 | 1,350 | 8 | 113,400,000 |
| | | Cleaning of structures | - | m ³ | 2,000 | 9 | 8 | 144,000 |
| | | Subtotal – I Cumulative | | | | | | |
| Periodic | 5th year | Roadbed repair | 2% of the total paved area | m ² | 17,200 | 2,925 | 2 | 100,620,000 |
| | | Overlay | 2% of the total paved area | m ² | 13,800 | 2,925 | 2 | 80,730,000 |
| | | Road shoulder repair | 3% of the total road | m ² | 10,500 | 1,350 | 2 | 28,350,000 |
| | | Repair of structures | - | m ³ | 220,000 | 89 | 2 | 39,160,000 |
| | | Subtotal – II Cumulative | | | | | | |
| Sum of regular and periodic maintenance – III (=I+II) | | | | | | | | 1,087,804,000 |
| General administrative cost | | | 10% of III | Formula | - | - | 1 | 108,780,400 |
| Grand total | | | | | | | | 1,196,584,400 |
| Per year cost | | | | | | | | 119,658,440 |

The cost summary above shows that the responsibility of the Tanzanian side is 119 million Tshs (equivalent to 11.9 million yen) annually for both regular and periodic maintenance. This is 7.9 % of the 2004/2005 maintenance budget of 1.5 billion Tshs (150 million yen) of TANROADS Mtwara Office and is considered to be an affordable burden.

2.6 Other Relevant Issues

Important items which the Tanzanian side will need to pay special attention to in order to ensure smooth Project implementation and fully realize and sustain the Project effects are as follows:

(1) Speeding-up of tax exemption and customs clearance procedures

Following the signing of the Exchange of Notes, which officially decides Project implementation, TANROADS will need to appeal to related organizations and agencies to ensure the prompt and certain implementation of tax exemptions and customs clearance.

(2) Holding of a Project explanation meeting for roadside residents on the Project section

Following the signing of the Exchange of Notes, which officially decides Project implementation, TANROADS will promptly need to hold a Project explanation meeting for roadside residents or their representatives.

(3) Traffic safety

Thoroughly instruct drivers to follow the instructions of traffic wardens during the works.

(4) Thorough notification of inconveniences caused by the works

Since the works can be expected to cause inconveniences to passing traffic, thoroughly notify this to road users via radio and other mass media.

CHAPTER 3

PROJECT EVALUATION AND RECOMMENDATIONS

CHAPTER 3

PROJECT EVALUATION AND RECOMMENDATIONS

3.1 Project Effect

Since implementation of the Project will lead to the improvement of road conditions and realization of safe and smooth traffic on the target section, the entire population of Mtwara Province of approximately 1,130,000 people, and especially the 440,000 residents of Masasi district living along the road, will realize the benefits. Table 3.1 indicates the anticipated effects of Project implementation.

Table 3-1 Project Effects

| Current Conditions and Problems | Project Measures | Direct Effects and Degree of Improvement | Indirect Effects and Degree of Improvement |
|---|-----------------------|---|---|
| <p>The present road is too narrow and rutted to allow safe and smooth traffic.</p> <ul style="list-style-type: none"> • Safe two-way traffic is not possible due to the narrow width and rutting of the road. • Safe running speeds are slow due to the state of the road surface and narrow width. • Safety problems such as falling and contact of pedestrians and bicycles are occurring due to the state of the road surface and narrow width. | <p>Road upgrading</p> | <ul style="list-style-type: none"> • Improvement in road safety through improving road flatness, separation of vehicles from pedestrians and bicycles through provision of shoulders (1.5 m on both sides from zero m at present), and so on • Shortening of travel times for vehicles using the road (approximately 50% reduction from 45 minutes to 17 minutes on the 22.5 km section and 83 minutes to 42 minutes on the total section of 55.1 km) • Increase in road traffic volume due to improvement in road standards regarding width and gradient, etc. (the current one-way traffic section of approximately 4 km will be reduced to zero km) | <ul style="list-style-type: none"> • Reduction of transportation costs due to shortening of transportation times and improvement of flatness (shortening of travel times over the section by around 50% will lead to reduced vehicle operating costs). • Contribution to stronger and more stable physical distribution through improvement in access • Contribution to local development, rectification of regional disparities, expansion of the market area, and stabilization of access to medical and education facilities thanks to reduction of road closure days to zero and improvement in road reliability |

3.2 Recommendations

3.2.1 Issues and Recommendations to be Addressed by the Tanzanian Side

- (1) Implementation of items to be borne by the Tanzanian side

It is indispensable that the Tanzanian side secures the right of way around the Project road and certainly completes the necessary procedures without hindrance to the Project by the time of Cabinet approval in Japan for construction of the Project facilities.

- (2) Education about traffic safety

Since the road repair works in the Project will lead to improvement in road conditions, vehicle speeds will be faster than they are now. Accordingly, in order to prevent an increase in major accidents, it is desirable that the Tanzanian side conducts educational activities to road users and local residents about traffic safety.

- (3) Overall development plan for Mtwara Development Corridor

The development of national highways 6 and 12, which include the Project route, is expected to promote development in Southern Tanzania and help realize functions of the international road connecting with neighboring Mozambique. Accordingly, promoting works on other roads requiring repair at the same time as conducting the Project works will be essential for development of the local area.

3.2.2 Collaboration with Technical Cooperation and Other Donors

Road development between the economic capital of Dar es Salaam and Mtwara is currently being implemented by the Government of Tanzania, international donors and agencies. Moreover, since donors and agencies are conducting studies and improvements on other parts of the Mtwara Corridor that includes the Project route, the Study Team checked these implementation conditions, gauged any problems and designed the Project plan to ensure that it is in harmony with the overall road network. Concerning technical cooperation, this was not required in the Project because JICA has already implemented technical cooperation with TANROADS.

APPENDICES

1. Member List of the Study Team
2. Study Schedule
3. List of Parties Concerned in the Recipient Country
4. Minutes of Discussions
5. Outline Design Drawings

1. Member List of the Study Team

(1) During the field surveys for the Preparatory Study

| Responsible Area | Organization | Name |
|--|--|------------------|
| Team Leader | JICA Tanzania Office, Chief Representative | Kiyoshi Masumoto |
| Chief consultant / Road Planner | Ingerosec Corporation | Hideaki Morita |
| Construction Planning / Cost Estimator | Ingerosec Corporation | Shin Onoda |

(2) During outline explanation of the draft basic design

| Responsible Area | Organization | Name |
|---------------------------------|---|--------------------|
| Team Leader | JICA Tanzania Office, Senior Representative | Toshihisa Hasegawa |
| Chief consultant / Road Planner | Ingerosec Corporation | Hideaki Morita |

2. Study Schedule

(1) During the field surveys for the Preparatory Study

| Day No. | Month | Date | Day | Team Leader Kiyoshi Masumoto | Planning Management Asuka Tsuboike | Chief consultant / Road Planner Hideaki Morita | Construction Planning / Cost Estimator Shin Onoda |
|---------|-------|------|-----|---------------------------------|---|--|---|
| 1 | 4 | 18 | Sat | | | Move (Japan – Dubai) | |
| 2 | | 19 | Sun | | | Move (Dubai - Tanzania) | |
| 3 | | 20 | Mon | Discussion at JICA Tanzania | Discussion at JICA Tanzania office Courtesy call EOJ, MoID, TANROADS | | |
| 4 | | 21 | Tue | | | TANROADS | |
| 5 | | 22 | Wed | | | TANROADS | |
| 6 | | 23 | Thu | | | Move (Dar⇒Masasi), TANROADS Mtwara | |
| 7 | | 24 | Fri | Signing of M/D | | Site investigation | |
| 8 | | 25 | Sat | | | Site investigation | Move (Japan – Dubai) |
| 9 | | 26 | Sun | | | Move (Masasi⇒Dar) | Move (Dubai - Tanzania) |
| 10 | | 27 | Mon | | | TANROADS Discussion, JICA Report | |
| 11 | | 28 | Tue | | | TANROADS | |
| 12 | | 29 | Wed | | | Move (Tanzania – Dubai) | Investigation at Dar |
| 13 | | 30 | Thu | | | Move (Dubai - Japan) | Move (Dar⇒Masasi) |
| 14 | 5 | 1 | Fri | | | | Site investigation |
| 15 | | 2 | Sat | | | | Site investigation |
| 16 | | 3 | Sun | | | | Move (Masasi⇒Dar) |
| 17 | | 4 | Mon | | | | JICA Report |
| 18 | | 5 | Tue | | | | Move (Tanzania – Dubai) |
| 19 | | 6 | Wed | | | | Move (Dubai - Japan) |

(2) During outline explanation of the draft basic design

| Day No. | Month | Date | Day | Team Leader Toshihisa Hasegawa | Planning Management Sin Maruo | Chief consultant / Road Planner Hideaki Morita | |
|---------|-------|------|----------------|------------------------------------|-------------------------------------|--|--|
| 1 | 8 | 22 | Sat | | | Move (Japan - Dubai) | |
| 2 | | 23 | Sun | | | Move (Dubai - Tanzania) | |
| 3 | | 24 | Mon | Discussion at JICA Tanzania office | | | |
| 4 | | 25 | Tue | | TANROADS (Draft report explanation) | | |
| | | | | | Courtesy call MoID | | |
| | | | | | TANROADS | | |
| | | | | | TANROADS, MoID discussion | | |
| 5 | | 26 | Wed | | TANROADS, MoID discussion | | |
| 6 | 27 | Thu | | MOF | | | |
| 7 | 28 | Fri | Signing of M/D | | | | |
| | | | Report to EOJ | | | | |
| 8 | 29 | Sat | | | Move (Tanzania - Dubai) | | |
| | | | | | | Move (Dubai - Japan) | |

3. List of Parties Concerned in the Recipient Country

(1) During the field surveys for the Preparatory Study

1) Ministry of Infrastructure Development : MoID

Edwin Mujwahuzi Assistant Director for Trunk Road Division

2) Tanzania National Roads Agency : TANROADS

Victor H. Seff Project Manager, Bilateral Project

Rajab Manger Project Engineer

Kitainda Harold Acting Head of Design

Mussa O. Mataka Regional Manager Mtwara

Leonard Nkini Project Engineer Mtwara

3) Embassy of Japan

Hiroshi Ito Second Secretary

4) JICA Tanzania Office

Kiyoshi Masumoto Chief Representative

Koji Makino Senior Representative

Asuka Tsuboike Representative

(2) During outline explanation of the draft basic design

1) Ministry of Infrastructure Development : MoID

Musa I. Iyombe Director of Roads

Samuel Jackson Principal Engineer, Department of Road

2) Tanzania National Roads Agency : TANROADS

Ephraem C M Mrema Chief Executive

Salutari J. Massawe Director of Project

Victor H. Seff Project Manager, Bilateral Project

Ebenazar R. Mollel Head of Design and Standards

3) Ministry of Finance and Economic Affairs

Andambike Mololo Department of External Finance

4) Embassy of Japan

Yukinori Seki Second Secretary

5) JICA Tanzania Office

Toshihisa Hasegawa Senior Representative

Sin Maruo Representative

4. Minutes of Discussions

- (1) During the field surveys for the Preparatory Study

**Minutes of Discussions
on the Preparatory Survey
on the Project for Upgrading Masasi – Mangaka Road
in the United Republic of Tanzania**

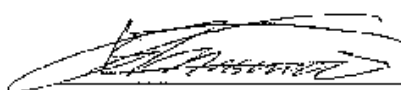
Based on the results of the Basic Design Study, the Government of Japan decided to conduct a Preparatory Survey (hereinafter referred to as "the Survey") on the project for Upgrading Masasi – Mangaka Road (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the United Republic of Tanzania (hereinafter referred to as "the Tanzania") the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Kiyoshi MASUMOTO, Chief Representative, JICA Tanzania Office, and is scheduled to stay in the country from April 19, 2009 to May 5, 2009.

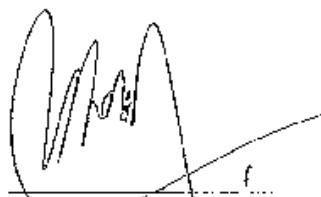
The Team held discussions with the officials concerned of the Government of Tanzania and conducted a field survey at the Project sites.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

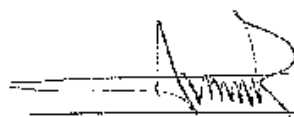
Dar es Salaam, April 24, 2009




Kiyoshi Masumoto
Leader
Preparatory Survey Team
Japan International Cooperation Agency



Ephraim C. Mrema
Chief Executive
Tanzania National Roads Agency
the United Republic of Tanzania



Joshua Raya
Ag. Director of Roads
Ministry of Infrastructure Development
the United Republic of Tanzania

Witness


Ngosha Said Magonya
Commissioner for External Finance
Ministry of Finance and Economic Affairs
the United Republic of Tanzania

ATTACHMENT

1. Purpose of the Preparatory Survey

- (1) To confirm the road section of phase 3 for total length 22.5Km (original 20.1Km + additional 2.4Km)
- (2) To discuss with the Tanzanian side, conduct the site survey and collect the necessary data and information necessary to examine on construction schedule and cost estimation.

2. Section of the phase 3 road

The Team explained followings;

- (1) The Project scope is decided as the road between Masasi to Mangaka (55.1Km) in the minutes of discussions (March 15, 2007) of the Basic Design Study of the Project.
- (2) The Japanese side divided the Project road into three sections as a result of Basic Design Study which was conducted in 2007 and first section covers 0Km – 15Km in phase 1, the second section covers 15Km – 35Km in phase 2 and the third section covers 35Km – 55.1Km in phase 3 respectively.
- (3) Phase 1 was completed in March, 2009.
- (4) The Detailed Design Study for phase 2 was implemented in May 2008. The necessity of re-examination of the execution plan was identified due to such external factors as remarkable worldwide rise in oil prices. As the result of re-examination, the modification of project distance for phase 2 from original 20Km to 17.6Km was concluded. The construction work for phase 2 is currently going.
- (5) The road section of phase 3 shall be 22.5Km (original 20.1Km + additional 2.4Km) in the Survey Stage.

Both sides confirmed that the total length of phase 3 is 22.5Km.

3. Project site (Phase 3)

The site of the Project is as shown in Annex-1.

4. Responsible and implementing Agency

- 4-1. The Responsible Ministry is Ministry of Infrastructure Development, and its organization chart is shown in Annex-2.
- 4-2. The Implementing Agency is Tanzania National Roads Agency (TANROADS), and its organization chart is shown in Annex-3.

5. Japan's Grant Aid Scheme

- 5-1. The Tanzanian side understands the Japan's Grant Aid scheme explained by the Team.

5-2. The Tanzanian side will take the necessary measures, as described in Annex-4 and 5, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Survey

6-1. The consultants will proceed to further survey in Tanzania until May 5, 2009.

6-2. JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around June, 2009.

6-3. When the contents of the report are accepted in principle by the Government of Tanzania, JICA will complete the final report and send it to the Government of Tanzania by August, 2009.


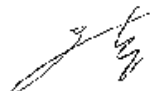
7. Other relevant issues

7-1. Both sides reconfirmed that the following undertakings should be taken by the Tanzanian side. The Tanzanian side explained that they shall allocate the budgets for those undertakings.

- (1) Removal of the existing trees along the Project road, and buildings and/or their exterior within the Project site.
- (2) Relocation and/or removal of existing utilities (power lines, water lines, etc.) including the underground facilities from the Project site.
- (3) Necessary arrangement for traffic control at necessary sections.
- (4) Necessary arrangement for the tax exemption of imported equipment, materials and vehicles for the Project.
- (5) Securing and clearance of the temporary yard.
- (6) Securing of site for disposal of waste.
- (7) Necessary arrangement for securing borrow pits and quarries.

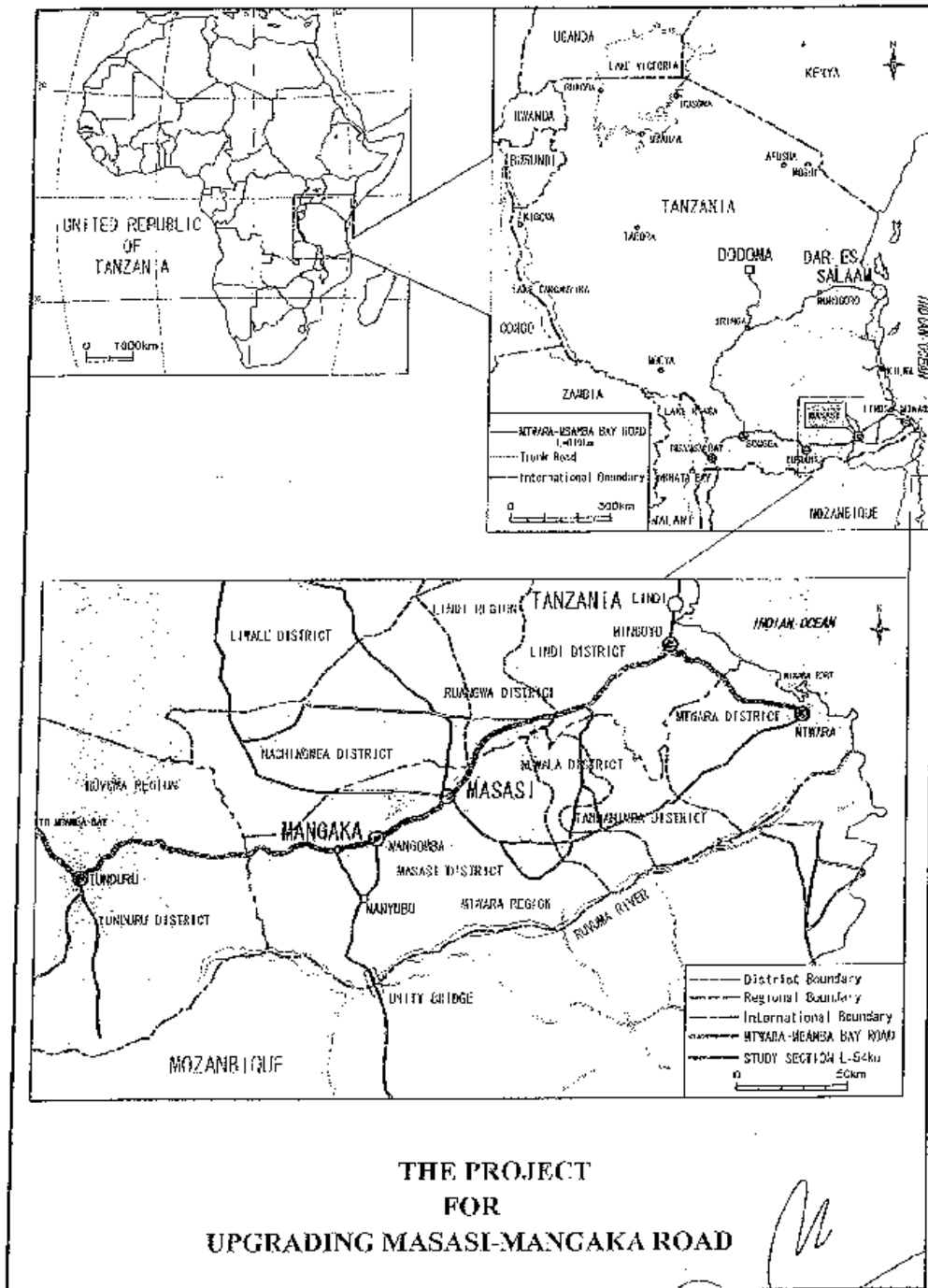
7-2. The Tanzanian side agreed on the following items requested by the Team;

- (1) To provide office space for the Team in Dar es Salaam, when required.
- (2) To provide the Team with available relevant data, information and materials necessary for the execution of the Survey.
- (3) To assign the counterparts for the Team during their stay.



2

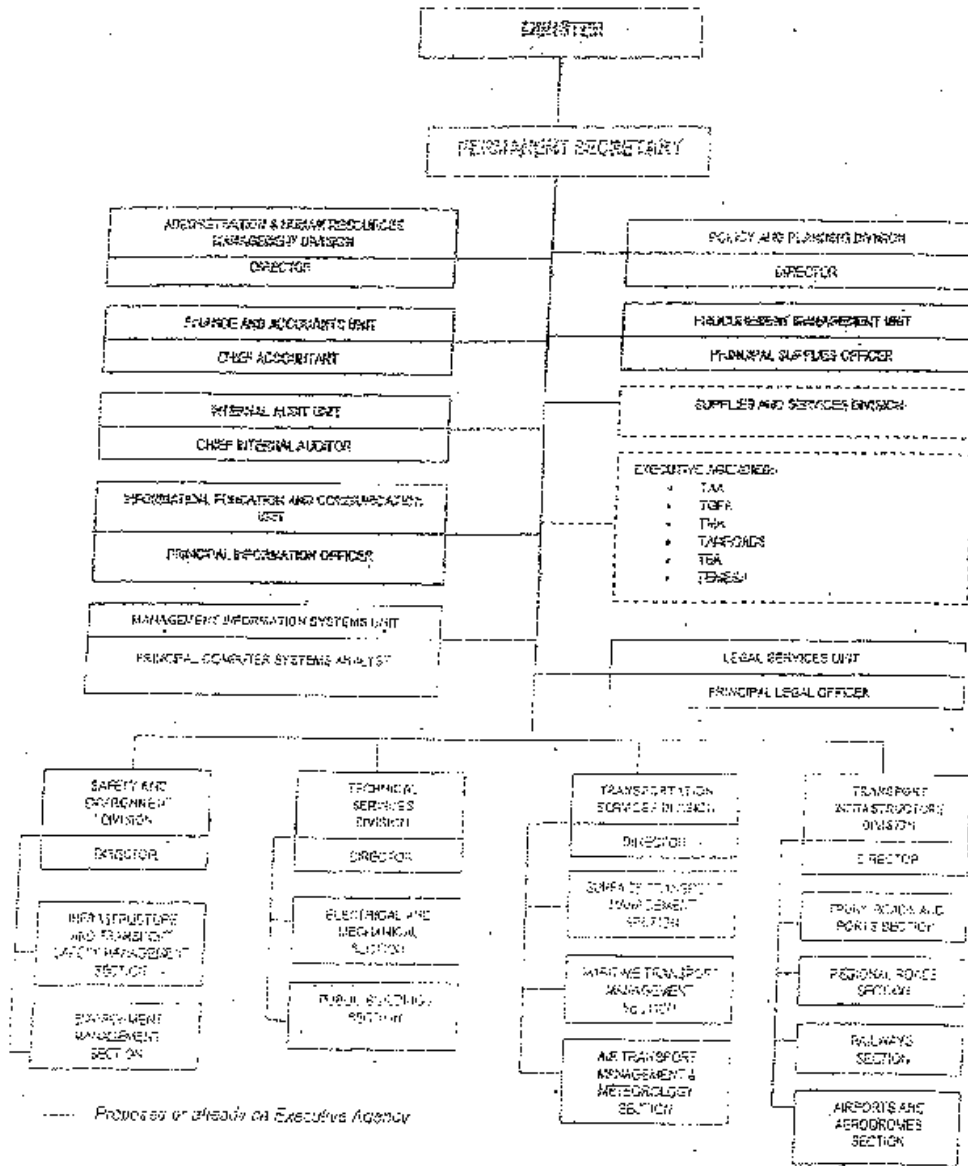




Location Map

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**THE ORGANISATION STRUCTURE OF THE MINISTRY OF
INFRASTRUCTURE DEVELOPMENT**
(Approved by the President on 6th July, 1968)



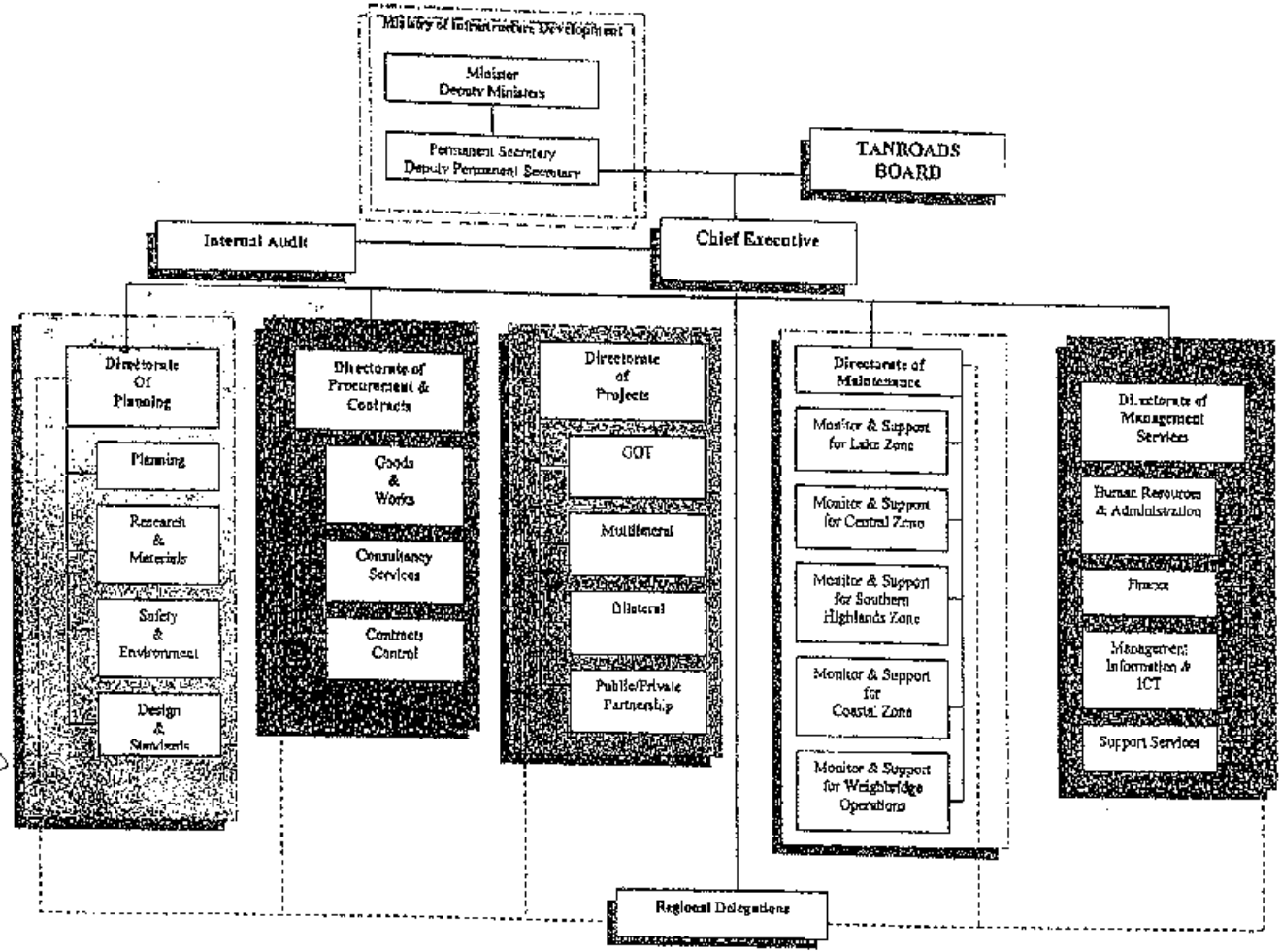
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Figure 1: Proposed Organization Structure for TANROADS (Headquarters)



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(2) During outline explanation of the draft basic design

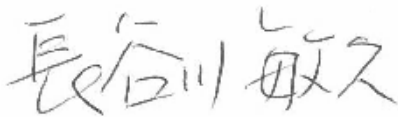
**Minutes of Discussions
on the Preparatory Survey
on the Project for Upgrading Masasi – Mangaka Road
in the United Republic of Tanzania
(Explanation on Draft Final Report)**

In March 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey team on "the Project for Upgrading Masasi – Mangaka Road" to the United Republic of Tanzania (hereinafter referred to as "Tanzania"), and through discussions, field survey and technical examination of the results in Japan, JICA prepared a draft final report of the study.

In order to explain and to consult with the concerned officials of the Government of Tanzania on the contents of the draft final report, JICA sent to Tanzania the Basic Design Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Toshihisa HASEGAWA, Senior Representative of JICA Tanzania Office, from August 23 to August 28, 2009.

As a result of discussions, both sides confirmed the main items described in the attached sheets.

Dar es Salaam, August 27, 2009



Toshihisa HASEGAWA
Leader
Preparatory Survey Team
Japan International Cooperation Agency

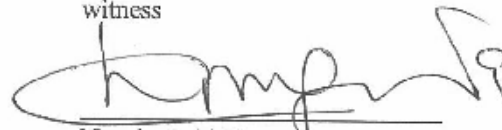


Ephraim C M Mrema
Chief Executive
Tanzania National Roads Agency (TANROADS)
the United Republic of Tanzania



Musa Iyombe
Director of Roads
Ministry of Infrastructure Development
the United Republic of Tanzania

witness



Ngosha Said Magonya
Commissioner for External Finance
Ministry of Finance and Economic Affairs
the United Republic of Tanzania



ATTACHMENT

1. Components of the Draft Final Report

The Tanzanian side agreed and accepted in principle the contents of the draft final report of the Preparatory Survey explained by the Team. As the result of the Survey, the proposed range of the Upgrading Masasi-Mangaka Road is as shown in ANNEX-1.

2. Cost Estimation

Both sides agreed that the Project Cost Estimation as attached in Annex-2 should never be duplicated or released to any third parties before the signing of all the Contracts for the Project.

3. Japan's Grant Aid Scheme

The Tanzanian side understood the Japan's Grant Aid scheme and the necessary measures to be taken by the Government of Tanzania as described in Minutes of Discussions signed on April 24 2009.

4. Schedule of the Study

JICA will complete the Final Report in English, in accordance with the confirmed items and send it to the Tanzanian side by the end of October, 2009.

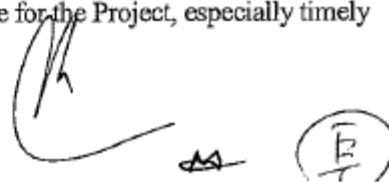
5. Environmental and Social Considerations

Both sides confirmed that the Tanzanian side had obtained permission of EIA for the Project and basic agreements from affected property owners.

6. Other Relevant Issues

6-1. The Tanzanian side confirmed that the following undertakings should be taken by the Tanzanian side at the Tanzanian expenses.

- (a) To secure the land for the Project,
- (b) To secure land for the temporary yard including removal of existing properties,
- (c) To secure site for borrow pit, quarry and disposal of waste,
- (d) Relocation of existing utilities (electricity power, telecommunication, well, etc.),
- (e) Removal of existing properties within necessary area (including building, trees, plants, etc.),
- (f) Necessary assistance to connect public utilities for the temporary yard to be used for site facilities such as site offices, plant yards, dormitory, etc. and for temporary works,
- (g) Necessary arrangement of detours for public traffic at necessary sections, e.g. securing of land, public announcement etc,
- (h) Necessary coordination among residents and/or road users and the Contractor,
- (i) Necessary coordination with concerned Ministry and/or Authority,
- (j) Necessary arrangement for timely issuance of the license and permission, e.g. Company License for Contractor, permission of quarrying, etc.
- (k) Necessary arrangement for the tax exemption and custom clearance for the Project, especially timely

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issuance of Government Notices.

- (l) Necessary arrangement of budget allocation for the commission for Authorization to Pay (A/P) and Payment,
- (m) Necessary arrangement of counter part personnel for the Project.

- 6-2. The Team strongly expressed concern over the time consuming for getting Government Notice (GN) on tax exemption. The Team insisted that this matter could negatively affect the successful completion of the Project construction works within the expected period, and requested to issue GN within thirty (30) calendar days from the day when TANROADS receive application for tax exemption. The Tanzanian side understood the concern expressed from the Team and promised to request the Ministry of Finance and Economic Affairs to comply.
- 6-3. The Team requested to take measures and allocate budget necessary for maintenance of the Project facilities after the completion of the construction works. The Tanzanian side agreed and promised that TANROADS shall take necessary actions to maintain them properly at its own expense.
- 6-4. The Tanzanian side expressed concern over the possibility of erosion on ditches along the Project road from the experience of the other road construction projects in Tanzania. The Team explained that the ditches were designed to prevent erosion considering the site conditions.

ANNEX-1 The proposed range of the Upgrading Masasi-Mangaka Road

ANNEX-2 Project Cost Estimation



AA

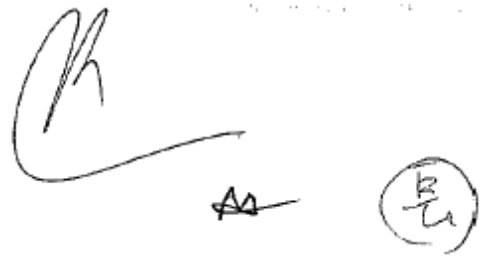
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ANNEX-2

Project Cost to be Borne by Japan's Grant Aid

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due to the confidentiality.**

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