Result of Scheme Formulation in Mvomero District

Record of Site Inspection (Step-2)

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 24, 2004

(1) Name of the scheme : Bwage

(2) Location (any point in the scheme) : Latitude: 5º57.628'S Longitude: 37º46.374'E

(3) Administration : Ward Kanga

: Village(s) Bwage

(4) Number of households : 323 households/ village

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☐ Paddy ☒ Maize ☒ Vegetable ☒ Others ( )

(3) Present markets : inside the village (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☒ No irrigation

(2) Present irrigated area : 0 ha (if the scheme area is already irrigated)

(3) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Kwengunga/Mkogila

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year ☒ Not established yet

(2) Name of the association :

(3) Registered year :

(4) Number of member : members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 40 ha

(2) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : Kwengunga/Mkogila

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development
☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Water shortage)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☐ High ☒ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

They need the available potential area to be developed.

7. History of the Scheme

8. Findings of the District Project Development Team

Rivers are drying off on October. Farmers utilized the residue moisture to produce crops during the off-season.

Member of the Site Inspection Team for Bwage scheme

Name	Organization	Specialty
Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Oman S. Omari	Mvomero District Office	Irrigation
Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Interview with village chief at village office.

Proposed potential area by the village.

Water source.

Observation

Major part of the proposed potential area is presently not cultivated. To develop irrigation area, land clearing is required, so that the cost for land clearing should be considered in cost estimate.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 24, 2004

(1) Name of the scheme : Kanga

(2) Location (any point in the scheme) : Latitude: 5º59.656'S Longitude: 37º45.528'E

(3) Administration : Ward Kanga

: Village(s) Kanga

(4) Number of households : 404 households/ village

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☒ Maize ☒ Vegetable ☐ Others ( )

(3) Present markets : unknown (0 km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☒ Scarce ☐ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : ha (if the scheme area is already irrigated)

(3) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Kisanke Mkange, Diblelo

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year ☒ Not established yet

(2) Name of the association :

(3) Registered year :

(4) Number of member : members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 80 ha

(2) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : Kisanke Mkange, Diblelo

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☒ New development
☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☐ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☒ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Water Shortage)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☐ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

They need assistance for outside for calculate improvement.

7. History of the Scheme

8. Findings of the District Project Development Team

Rivers are drying off on September. Drainage problems occures during the rainy season.

Member of the Site Inspection Team for Kanga scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Interview with village chief at village office.

Measuring location of the scheme by GPS

Irrigated paddy field.

Traditional intake.

Observation

The scheme is presently irrigated by traditional irrigation system and no major facilities are observed. The irrigable area in wet season is 80 ha and 10 ha in dry season according to the beneficiaries. According to the villagers, the most sever problems for the scheme is drainage (or flood control). The problem seems to occur since the area is located very near from the river.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 24, 2004

(1) Name of the scheme : Dihinda/ Difinga

(2) Location (any point in the scheme) : Latitude: 6º03.832'S Longitude: 37º41.556'E

(3) Administration : Ward Kanga

: Village(s) Dihinda

(4) Number of households : _____ households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (_____ ha in average year)

(2) Present crops : ☒ Paddy ☒ Maize ☒ Vegetable ☒ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☒ Scarce ☐ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☒ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 2 ha (if the scheme area is already irrigated)

(3) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R Lusonge

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year _____ ☒ Not established yet

(2) Name of the association :

(3) Registered year :

(4) Number of member : _____ members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others (_____) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 200 ha

(2) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : R. Lusonge

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☒ New development
☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Water shortage)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☐ High ☒ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

Few farmers demand the outside support to develop their scheme.

7. History of the Scheme

8. Findings of the District Project Development Team

River Lusonge create a reservoir at the middle of area.
The reservoir is called Kontembo.

Member of the Site Inspection Team for Dihinda schme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Interview with village chief in front of village office.

Rainfed paddy area.

Sub-water source.

Main water source.

Observation

The scheme seems to have some amount of water resource potential. However, the scheme is laying two villages and some farmers in upstream village already started irrigation by themselves. Social aspects on irrigation development need to be carefully studied for this scheme.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 24, 2004

(1) Name of the scheme : Kwadoli

(2) Location (any point in the scheme) : Latitude: 6º02.352'S Longitude: 37º37.4974'E

(3) Administration : Ward dingoya

: Village(s) Kwadoli

(4) Number of households : 260 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☒ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Madizim (7 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☒ Scarce ☐ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R. Mwero

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year ☒ Not established yet

(2) Name of the association :

(3) Registered year :

(4) Number of member : members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 75 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : R. Mwero

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☒ New development
☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☐ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (_____)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☐ High ☒ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

Needs irrigation scheme.

7. History of the Scheme

8. Findings of the District Project Development Team

The place for scheme is not accessible.

Member of the Site Inspection Team for Kwadoli scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Interview with village chief in front of village office.

Proposed potential area (across the river).

Observation

The proposed potential area by village people is far from the village and due to river flowing between the potential area and village, very difficult to approach. An access road from the village to potential area is essential for the scheme, so that it should be considered in cost estimate.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information | Surveyed Date: May 25, 2004

(1) Name of the scheme : Ndole

(2) Location (any point in the scheme) : Latitude: 6º08.647'S Longitude: 37º24.683'E

(3) Administration : Ward Makati

: Village(s) Ndole

(4) Number of households : _____ households/ _____

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (_____ ha in average year)

(2) Present crops : ☐ Paddy ☒ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Inside village (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☒ Scarce ☐ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☒ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : _____ ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Digomazi River

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year _____ ☒ Not established yet

(2) Name of the association : _____

(3) Registered year : _____

(4) Number of member : _____ members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others (_____) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 60 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : _____

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development
☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☐ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☒ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☒ Soil erosion in the scheme

Cause of conflict (Poor conveyance structure)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☐ High ☐ Moderate ☒ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

They need a support for rehabilitate their scheme.

7. History of the Scheme

8. Findings of the District Project Development Team

Water confict arises due to water losses along the conveyance structures.

Member of the Site Inspection Team for Ndole scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Interview with village chief in front of village office.

Irrigated area.

Water source river.

Canal supplying water to the irrigated area.

Observation

The scheme is located at hilly area of which altitude is about 2,500m and isolated from Mvomero town area, since condition of the access road is very poor. According to the villagers, traders comes to buy their products several times in a year, even access to the village is very difficult. The intake facility of the scheme was constructed about 20 years ago, but irrigation system to downstream beneficial area was not completed. Since then, the scheme was almost abandon and only limited area located upstream of beneficial area is presently irrigated.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: 25 May, 2004

(1) Name of the scheme : Digoma

(2) Location (any point in the scheme) : Latitude: 6º05.820'S Longitude: 27º36.400'E

(3) Administration : Ward Diongoya

: Village(s) Digoma

(4) Number of households : 619 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional ☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 3 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Mjonga/Lugofu

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year ☐ Not established yet

(2) Name of the association : Lugofu Agriculture Group

(3) Registered year :

(4) Number of member : 14 members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 200 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : River Mjonga/ Lugofu

(4) Water right : ☐ Granted ☐ Not granted yet ☒ Intended ☐ Not aware

(5) Required works : ☐ Rehabilitation ☒ New development ☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☐ In cash ☒ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Changes of river corse)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

They highly require irrigation facilities.

7. History of the Scheme

8. Findings of the District Project Development Team

River banks are not stable at the middle part of the scheme.

Member of the Site Inspection Team for Digoma scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Measuring coordinate of potential area using GPS.

Furrow irrigation performed by villager.

Bamboo aqueduct.

Water source.

Observation

The potential are of the scheme is presently cultivated by rainfed manner. The scheme seems to have enough Main water resources. According to the villagers, the most sever problem for the scheme is flood control. Some area nearby the potential area is practicing beautiful irrigation system by villagers themselves.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information | Surveyed Date: May 25, 2004

(1) Name of the scheme : Komtonga

(2) Location (any point in the scheme) : Latitude: 6º10.142'S Longitude: 37º25.077.'E

(3) Administration : Ward Sungaji

: Village(s) Kamtonga

(4) Number of households : _____ households/ _____

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (_____ ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☐ No problem ☐ Partially affected ☒ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : _____ ha (if the scheme area is already irrigated)

(3) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Msengele/Mvadi

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year _____ ☐ Not established yet

(2) Name of the association : _____

(3) Registered year : _____

(4) Number of member : _____ members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others (_____) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 157 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : R. Divue

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development
☒ Improvement (from traditional to modern) ☒ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☐ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name _____ (_____ km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (_____)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☐ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

Irrigation facilities required in order to improve the scheme.

7. History of the Scheme

8. Findings of the District Project Development Team

River Divue which is a permenent river could used to irrigate large area of Komtonga scheme. However drainage improvement should also taken into account.

Member of the Site Inspection Team for Komtonga scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Proposed potential area.

Proposed potential area.

Observation

According to the villagers, the scheme does not have enough Main water resources. Consequently, the scheme cannot meet paddy requirement and villagers applied irrigation system using capillary movement.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 26, 2004

(1) Name of the scheme : Mkindo

(2) Location (any point in the scheme) : Latitude: 6º15.344'S Longitude: 37º32.387.E

(3) Administration : Ward Hembeti

: Village(s) Mkindo

(4) Number of households : 1,740 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (40 ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : (km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional

☒ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 40 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R. Mukindo

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year 1994 ☐ Not established yet

(2) Name of the association : Mkindo Farmers Coop. Society

(3) Registered year : 1998

(4) Number of member : 96 members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 80 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : R. Mukindo

(4) Water right : ☒ Granted ☐ Not granted yet ☐ Intended ☐ Not aware

(5) Required works : ☒ Rehabilitation ☐ New development

☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☐ In cash ☒ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (_____ km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Shortage of irrigation water due to water losses in main canal.)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

Improvement of main canal is needed.

7. History of the Scheme

8. Findings of the District Project Development Team

See page on main canal which is not lined. Lining is needed.
Field canal needs to be rehabilitate.
Out growers encroached irrigation water.
Poor field levelling causes poor drainage.

Member of the Site Inspection Team for Mkindo scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from village chief.

Irrigated area.

Headworks.

Main canal.

Observation

Major facilities of the scheme were constructed under Dutch assistance in 1985 and regional government constructed minor facilities. The scheme seems to be most advanced scheme as far as irrigation aspect. According to the interview with villagers, present problems of the scheme are water leakage from the canal and land leveling.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 26, 2004

(1) Name of the scheme : Mgongola

(2) Location (any point in the scheme) : Latitude: 6º15.809'S Longitude: 37º32.691.'E

(3) Administration : Ward Hembeti

: Village(s) Mkindo, Dihombo

(4) Number of households : _____ households/ _____

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (_____ ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : (_____ km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional

☐ Modern ☐ Rainwater harvesting ☒ No irrigation

(2) Present irrigated area : _____ ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : River Mkindo

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year _____ ☒ Not established yet

(2) Name of the association : _____

(3) Registered year : _____

(4) Number of member : _____ members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others (_____) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 650 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : _____

(4) Water right : ☒ Granted ☐ Not granted yet ☐ Intended ☐ Not aware

(5) Required works : ☐ Rehabilitation ☒ New development

☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name MOROGORO (70 km from the site)

4. Anticipated Negative Impacts

☐ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Not applicable)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

They are expecting the irrigation scheme to be developed.

7. History of the Scheme

8. Findings of the District Project Development Team

At present paddy cultivation is done under rainfed.

Member of the Site Inspection Team for Mgongola scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from village chief.

Measuring location of potential area by GPS.

Observation

The water source of the scheme is same as Mkindo scheme.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 2, 2004

(1) Name of the scheme : Dihombo

(2) Location (any point in the scheme) : Latitude: 6º15.869'S Longitude: 37º32.040.'E

(3) Administration : Ward Hembeti

: Village(s) Dihombo

(4) Number of households : 840 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : Inside village (0 km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☒ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 16 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R. Dizingawi

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year 1999 ☐ Not established yet

(2) Name of the association : Mafanikio Farmers Group (association not yet formed)

(3) Registered year : 2000

(4) Number of member : 20 members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☒ Irrigation Facilities ☐ Others ( ) ☐ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 160 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source :

(4) Water right : ☒ Granted ☐ Not granted yet ☐ Intended ☐ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development
☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☐ In cash ☒ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☒ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (The scheme and water source are the same.)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☒ Enough ☐ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

7. History of the Scheme

8. Findings of the District Project Development Team

Association is belong to 20 farmers. There is a need to mobilize farmers to join in the association.

Member of the Site Inspection Team for Dihombo scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from village chief.

Headworks.

Left main canal.

Right main canal.

Observation

The facilities were constructed by World Bank project. According to the beneficiaries, only a part of planned irrigation command area is presently irrigated due to the water shortage.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 26, 2004

(1) Name of the scheme : Hembeti

(2) Location (any point in the scheme) : Latitude: 6º16.250'S Longitude: 37º31.050.'E

(3) Administration : Ward Hembeti

: Village(s) Hembeti

(4) Number of households : 720 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 20 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source :

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year 2001 ☐ Not established yet

(2) Name of the association : Umoja Irrigation Group

(3) Registered year :

(4) Number of member : 5 members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 80 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : Dizingwi

(4) Water right : ☐ Granted ☒ Not granted yet ☐ Intended ☐ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development
☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☐ In cash ☒ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (_____ km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Poor water management)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

Improvement of Irrigation structures required.

7. History of the Scheme

8. Findings of the District Project Development Team

No parmanent intake.

Irrigation canal constructed does not meet the standard.

Member of the Site Inspection Team for Hembeti scheme		
Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Measuring location of potential area by GPS.

Observation

The facilities were constructed by World Bank project. According to the beneficiaries, only a part of planned irrigation command area is presently irrigated due to the water shortage.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 26, 2004

(1) Name of the scheme : Dakawa

(2) Location (any point in the scheme) : Latitude: º'S Longitude: º.'E

(3) Administration : Ward Mvomero

: Village(s) Dakawa

(4) Number of households : _____ households/ _____

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (_____ ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional
☒ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 2,000 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Wami River

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year _____ ☐ Not established yet

(2) Name of the association : _____

(3) Registered year : _____

(4) Number of member : _____ members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others (_____) ☐ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 3,000 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : Wami River

(4) Water right : ☒ Granted ☐ Not granted yet ☐ Intended ☐ Not aware

(5) Required works : ☒ Rehabilitation ☐ New development
☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☐ Gravity ☒ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Existing ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name MOROGORO (45 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Not equal distribution due to the absence of pump.)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☒ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

They need to have an identified water users association.

7. History of the Scheme

8. Findings of the District Project Development Team

Water conflict due to insufficient water supply to the scheme.
Only 2 pumps are functioning out pf 6 pumps.

Member of the Site Inspection Team for Dakawa scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from beneficiaries.

Information collection at research institute.

Main canal.

Observation

The scheme was developed as government project and it is presently managed by four organizations ( ). The scheme is now under transferring to the farmers.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 26, 2004

(1) Name of the scheme : Wami Luhindo

(2) Location (any point in the scheme) : Latitude: 6º28.379'S Longitude: 37º33.337.'E

(3) Administration : Ward Mvomero

: Village(s) Wami Luhindo

(4) Number of households : 665 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (Yams)

(3) Present markets : (km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional

☐ Modern ☒ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : ha (if the scheme area is already irrigated)

(3) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R. Luhindo

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year 2002 ☐ Not established yet

(2) Name of the association : Mkombozi

(3) Registered year :

(4) Number of member : 30 members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 100 ha

(2) Main water resources : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : R. Luhindo

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☒ Rehabilitation ☐ New development

☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☐ Gravity ☐ Pump ☒ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Insufficient Irrigation water.)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☒ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

They highly need a support to improve their Rainwater harvesting system.

7. History of the Scheme

8. Findings of the District Project Development Team

Canal construction is needed.

Member of the Site Inspection Team for Wami Luhindo scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from beneficiaries.

Facility for water harvesting (not well functioning).

Damaged facility for water harvesting.

Observation

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 27, 2004

(1) Name of the scheme : Bunduki

(2) Location (any point in the scheme) : Latitude: 7º01.502'S Longitude: º37.37.844'E

(3) Administration : Ward Bunduki

: Village(s)

(4) Number of households : 1,560 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☐ Paddy ☐ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Langali (9 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☒ Scarce ☐ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 80 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R. Mgeta and its tributaries

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year ☐ Not established yet

(2) Name of the association : Each canal has its own association.

(3) Registered year :

(4) Number of member : members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☒ Irrigation Facilities ☐ Others ( ) ☐ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 560 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : Mgeta and its tributaries

(4) Water right : ☐ Granted ☐ Not granted yet ☒ Intended ☐ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development
☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☒ In cash ☐ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☐ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name Langali (9 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☒ Soil erosion in the scheme

Cause of conflict ( )

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☒ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

Improvement of irrigation systems is required.

7. History of the Scheme

8. Findings of the District Project Development Team

Water conflict arises due to insufficient irrigation water.
Irrigation committees supervise water distribution rules.
Farmers exchange visits to the areas where bench terraces is constructed.

Member of the Site Inspection Team Bunduki scheme		
Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from extension staff.

Traditional intake.

Largest river flowing in the village.

Observation

The scheme is situated hilly area of the Uluguru Mountains of which altitude is about m. The scheme consists of numerous small irrigation systems. The small irrigation systems are taking water from small tributaries.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 27, 2004

(1) Name of the scheme : Tchenzema

(2) Location (any point in the scheme) : Latitude: 7º05.473'S Longitude: 37º35.652.'E

(3) Administration : Ward Tchemzema

: Village(s)

(4) Number of households : 3,070 households/ ward

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☐ Paddy ☐ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☒ Scarce ☐ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional ☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 280 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R. Mbakana and its tributaries

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year ☐ Not established yet

(2) Name of the association : Each village has irrigation association.

(3) Registered year :

(4) Number of member : members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☒ Irrigation Facilities ☐ Others ( ) ☐ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 342 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : R. Mbakana and its tributaries

(4) Water right : ☐ Granted ☐ Not granted yet ☒ Intended ☐ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development ☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☒ In cash ☐ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☐ Paddy ☐ Maize ☐ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☒ Affection of protected area ☒ Soil erosion in the scheme

Cause of conflict (Irrigation water abstrated is not enough)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☒ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

Improvement for irrigation facilities is highly needed.

7. History of the Scheme

8. Findings of the District Project Development Team

2 village Nyandira and Tchenzema have received a suppport of improving the Traditional Irrigation canal by UMADEP.

The improved canals are of *UKU group – Nyandira

* Mkombozi group – Tchenzema.

Member of the Site Inspection Team Tchenzema scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from ward chief.

One of the water sources.

Market and storage construction by French aid.

Scenery of the village.

Observation

The scheme is situated hilly area of the Uluguru Mountains of which altitude is about m. The scheme consists of numerous small irrigation systems. The small irrigation systems are taking water from small tributaries. The village is promoting vegetable and fruit production using its cool weather.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 27, 2004

(1) Name of the scheme : Langali

(2) Location (any point in the scheme) : Latitude: 7º03.462'S Longitude: 37º34.738.'E

(3) Administration : Ward Langali

: Village(s)

(4) Number of households : _____ households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (_____ ha in average year)

(2) Present crops : ☐ Paddy ☐ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Mzinga/Mindu Mgeta and their tributaries

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year 2004/2002 ☐ Not established yet

(2) Name of the association : Mniya Mindu & Mala/Masama

(3) Registered year :

(4) Number of member : 30 members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others (_____) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 300 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source :

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development
☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☒ In cash ☐ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☐ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name _____ (_____ km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☒ Land conflict ☐ Affection of protected area ☒ Soil erosion in the scheme

Cause of conflict (Land conflict occures in the boundary)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

They need to be supported inorder to improve their traditional irrigation canals.

7. History of the Scheme

8. Findings of the District Project Development Team

Water shortage occures due to insufficient water abstraction for the scheme. Some rocks dry up the water.

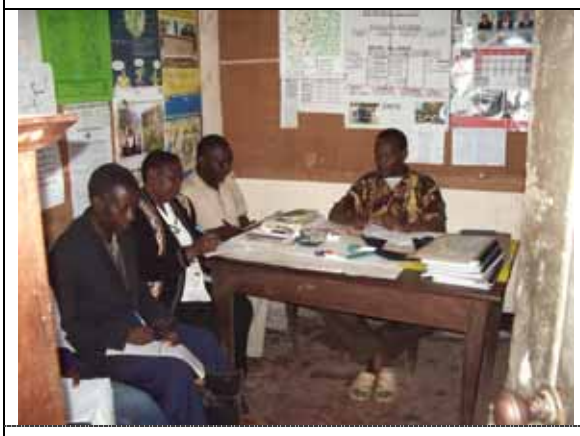
There is an idea of consolidating small farmers groups from each village in order to form one association for the ward level.

Currently there is a farmers network.

Member of the Site Inspection Team Langali scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos



Information collection from village chief.

One of the canal systems near the village.

Market in the village.

Observation

The scheme is situated hilly area of the Uluguru Mountains of which altitude is about m. The scheme consists of numerous small irrigation systems. The small irrigation systems are taking water from small tributaries.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 27, 2004

(1) Name of the scheme : Mlali/Kipera

(2) Location (any point in the scheme) : Latitude: 6º57.155'S Longitude: 37º31.738.'E

(3) Administration : Ward Mlali

: Village(s) Mlali

(4) Number of households : 1,900 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : On farm market/ Market day (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional
☒ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 60 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Mlali river

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☒ Established in year 2003 ☐ Not established yet

(2) Name of the association : Mlali/Kipera Irrigator's Association

(3) Registered year : 2003

(4) Number of member : 250 members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☒ Irrigation Facilities ☐ Others ( ) ☐ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 400 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : River Mlali

(4) Water right : ☐ Granted ☒ Not granted yet ☐ Intended ☐ Not aware

(5) Required works : ☒ Rehabilitation ☐ New development
☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☒ Existing ☐ Planned by year _____ ☐ Not sure

(2) Mode of contribution to development : ☐ In cash ☒ In kind ☐ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☒ Soil erosion in the scheme

Cause of conflict (Water shortage)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☒ Additional support is required ☐ None

6. Opinions of Village Officers and Beneficiaries

They need an additional support to make the system function properly.

7. History of the Scheme

8. Findings of the District Project Development Team

Siltation at the intake was reported.
The scheme experiences water shortage.
There is a need to educate farmers not to cultivate near the river banks.

Member of the Site Inspection Team for Mlali scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from village chief.

Damaged headworks by siltation.

Intake with sand trap.

Sand flushing channel (not functioning well).

Observation

The scheme was constructed by the government in 1950s. Headworks of the scheme is totally damaged by siltation and temprary closing of river was made by sand bags. Desiltation works at intake site was tried by beneficiaries but it was failed due to the amount of siltation. Reconstruction of headworsk at about 2 km upstream of the existing headworks is proposed.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 27, 2004

(1) Name of the scheme : Manza

(2) Location (any point in the scheme) : Latitude: 7º00.932'S Longitude: 37º30.795.'E

(3) Administration : Ward

: Village(s) Manza

(4) Number of households : 451 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village, Mlali (km from the site)

(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional ☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 40 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : R. Mandee

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year ☒ Not established yet

(2) Name of the association :

(3) Registered year :

(4) Number of member : members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 120 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : R. Mandee

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development ☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name _____ (_____ km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☒ Land conflict ☐ Affection of protected area ☒ Soil erosion in the scheme

Cause of conflict (_____)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

Water source is so deep to abstruct its water.

7. History of the Scheme

8. Findings of the District Project Development Team

Irrigation water seems not to be enough.

In the potential area, 40 ha is occupied by one person.

Member of the Site Inspection Team for Manza scheme		
Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from village chief.

Traditional intake.

Observation

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 27, 2004

(1) Name of the scheme : Tangeni

(2) Location (any point in the scheme) : Latitude: 6º55.711'S Longitude: 37º36.2 09.'E

(3) Administration : Ward Mzumbe

: Village(s) Tangeni

(4) Number of households : _____ households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (_____ ha in average year)

(2) Present crops : ☐ Paddy ☐ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional

☐ Modern ☐ Rainwater harvesting ☐ No irrigation

(2) Present irrigated area : 50 ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Tangeni River

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year _____ ☒ Not established yet

(2) Name of the association : Several groups are responsible for water management.

(3) Registered year :

(4) Number of member : _____ members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others (_____) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 200 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond

☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : Tangeni River

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development

☒ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☐ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (Insufficient irrigation water due to absence of permanent intake.)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

Permanent intake is required.

7. History of the Scheme

8. Findings of the District Project Development Team

There are numerous irrigation canals owned by individual canal.
No permanent intake at abstraction point.

Member of the Site Inspection Team for Tangeni scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from villager.

Measuring scheme location by GPS. 113

Observation

The scheme is situated foot of the Uluguru Mountains. The scheme consists of numerous small irrigation systems. The small irrigation systems are taking water from small tributaries.

Record of Site Inspection **Survey Sheet for Quick Site Inspection**

1. General Information Surveyed Date: May 27, 2004

(1) Name of the scheme : Vikenge

(2) Location (any point in the scheme) : Latitude: 6º54.933'S Longitude: 37º34.504.'E

(3) Administration : Ward Mzumbe

: Village(s) Vikenge

(4) Number of households : 1,400 households/

2. Present Condition of the Potential Area (should be interviewed with villagers and confirmed by site visit)

2.1 Present Agricultural Conditions in the Potential Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (ha in average year)

(2) Present crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (Yams)

(3) Present markets : Inside the village (0 km from the site)

(4) Drainage problem : ☒ No problem ☐ Partially affected ☐ Strongly affected

(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System

(1) Current irrigation system : ☐ Traditional ☐ Improved traditional ☐ Modern ☐ Rainwater harvesting ☒ No irrigation

(2) Present irrigated area : ha (if the scheme area is already irrigated)

(3) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(4) Name of the water source : Mgera /Lukulunge R.

2.3 Existing Irrigators' Association (IA) or Group Related with Irrigation

(1) Establishment of IA : ☐ Established in year ☒ Not established yet

(2) Name of the association :

(3) Registered year :

(4) Number of member : members

2.4 On-going support on irrigation development by government or some organization

(1) Type of support : ☐ Irrigation Facilities ☐ Others ( ) ☒ None

3. Village Proposed Plan by O&OD etc. (proposed development plan by village)

3.1 Irrigation System Development Plan

(1) Potential area : 200 ha

(2) Main water resources : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond ☐ Groundwater ☐ Spring ☐ Rain for water harvesting

(3) Name of the water source : Mgera/Lukulunge R.

(4) Water right : ☐ Granted ☐ Not granted yet ☐ Intended ☒ Not aware

(5) Required works : ☐ Rehabilitation ☐ New development ☐ Improvement (from traditional to modern) ☐ Drainage improvement

(6) Irrigation type : ☒ Gravity ☐ Pump ☐ Rain water harvesting

(7) Water quality : ☒ No problem ☐ Anticipated to damage crop cultivation

3.2 Irrigators' Association Establishment Plan

(1) Establishment plan : ☐ Established ☐ Planned by year _____ ☒ Not sure

(2) Mode of contribution to development : ☐ In cash ☐ In kind ☒ None

3.3 Agriculture Development Plan

(1) Proposed crops : ☒ Paddy ☐ Maize ☒ Vegetable ☐ Others (_____)

(2) Proposed markets : Name On farm (0 km from the site)

4. Anticipated Negative Impacts

☒ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Affection of protected area ☐ Soil erosion in the scheme

Cause of conflict (There is no water control structure / Farmers pastoralist conflict)

5. Observation by the Inspection Team

(1) Farmers motivation for irrigation : ☒ High ☐ Moderate ☐ Low

(2) Present support to the scheme : ☐ Enough ☐ Additional support is required ☒ None

6. Opinions of Village Officers and Beneficiaries

Land demarcatiion should be done properly – land use planning for pastoralists and farmers.
Construction of irrigation structures.

7. History of the Scheme

8. Findings of the District Project Development Team

As far as the water resource is available, establishment of the scheme is possible.

Member of the Site Inspection Team for Vikenge scheme

Name	Organization	Specialty
Mr.Eliammani Nnyiti	Morogoro Zonal Irrigation Unit	Agriculture/Soil
Mr.David N. Chemka	Morogoro Zonal Irrigation Unit	Irrigation
Mr.Oman S. Omari	Mvomero District Office	Irrigation
Mr.Remijo J. Mpagama	Mvomero District Office	Agriculture/Soil
Ms.Mdule Kidawa Omari	Mvomero District Office	Agriculture extension
Mr.Jun Tsurui	JICA Study Team	Irrigation

Site Photos

Information collection from villager.

Water source.

Observation

The scheme is situated at foot of the Uluguru Mountains. The scheme consists of numerous small irrigation systems. The small irrigation systems are abstracting water from small tributaries.

Result of Scheme Formulation in Mvomero District

Record of Preliminary Planning (Step-5 and -6)

Form-3 Survey Sheet for Interview Survey with Stakeholders (1/3)

Sub-step 3(a) Present Conditions of Agriculture and Marketing

Applicability The sub-step should be applied to all schemes.

1) Land Use in the Potential Area | Scheme Name | *Komtonga* | Surveyed Date | *15/6/2004*

If the potential area is not clearly defined, agree with villagers on the potential area as village area, basin area or other area. If the cultivated area is not clear, estimate from the total household number and the average holding size. The village extension officer should confirm the villagers' answers in order to avoid odd data.

(1) Potential Area (ha):	*140 ha*
(2) Cultivated Area within the Potential Area (ha):	*140 ha*
(3) Present Irrigated Area in the cultivated Area (ha):	*50 ha*
(4) Present Rainfed Area in the Cultivated Area (ha):	*90 ha*
(5) Average Holding Size/Family in the Potential Area (ha):	*1 ha*
(6) Total Household Number in the Potential Area:	*589*

2) Crop Production in the Potential Area

Let the farmers select two major rainy and dry season crops grown in the potential area. As for the yield and the price (farm gate price), ask farmers the maxima and minima in order to obtain average figures. Avoid any data for extraordinary years. The village extension officer should confirm the villagers' answers in order to avoid odd data.

*** Unit for Yield: bags/acre and weight/bag for cereals (paddy/maize), kg/acre for vegetables**
**** Unit for Price: Tsh/bag and weight/bag for cereals (paddy/maize), Tsh/kg for vegetables**

	Rainy Season		Dry Season	
(1) Name of Crops:	*Paddy*		*Paddy*	
(2) Cropped Area (ha):	*70 ha*		*50 ha*	
(3) Rainfed or Irrigated:	*Rainfed*		*Irrigated*	
(4) Month of Land Preparation:	*Nov-Dec*		*Aug-July*	
(5) Month of Harvest:	*April-May*		*Dec-Nov*	
(6) Maximum Yield*:	*1.2 ton/ha*		*2 ton/ha*	
Minimum Yield*:	*0.8 ton/ha*		*1 ton/ha*	
Weight/bag (kg):				
(7) Maximum Price**:	*208 Tsh/kg*		*160 Tsh/kg*	
Minimum Price**:	*180 Tsh/kg*		*100 Tsh/kg*	
Weight/bag (kg):				

3) Major Constraints to Crop Production

Let the farmers select three major constraints to crop production in the potential area. Do not spend a long time for discussion; just try to understand the level of irrigation needed for the scheme.

(1) *Poor drainage* (2) *Poor layout/water distribution* (3) *Lack of cropping calendar*

4) Farmers Supporting System

Ask the following questions on technical assistance and extension services.

(1) Technical Assistance on Irrigation [X] Available (extension) [X] Available (other party) [ ] Not available

(2) Extension Services: [X] Satisfied [ ] Not satisfied (Reasons) ____

5) Input Supply for the Potential Area

(1) Improved Seeds:	[ ]	In use: Amount __	[X]	Not in Use: Reason *Not available*
(2) Chemical Fertilizers:	[ ]	In use: Amount __	[X]	Not in Use: Reason *Not affordable*

(3) Agro-chemicals:		In use: Amount __	X	Not in Use: Reason *Not affordable*
(4) Agricultural Machinery:		In use: Amount __	X	Not in Use: Reason *Poor drainage*

6) Marketing System in the Potential Area

(1) Market for Paddy:	X	Middleman	X	Local Market		Town Market
(2) Market for Vegetables:	X	Middleman	X	Local Market		Town Market

7) Possibility of Group Purchasing and Selling

Since group purchasing and selling of inputs and products seems important for future development, ask the possibility in the future.

	High possibility through _____	X	Low possibility		No possibility

Form-3 Survey Sheet for Interview Survey with Stakeholders (2/3)

Sub-step 3(b) Present Conditions of Institutions

Applicability This sub-step should be applied to proposed schemes where circled groups already exist.

1) Existence of organization

[O] Irrigators' Association (IA) [O] Farmers' Group (FG) etc. [ ] No organization

1) General Information | Scheme Name: *Komtonga* | Surveyed Date: *15/6/2004*

(1) Name of IA/FG: *Komtonga Farmers Production Group*

(2) Established Year of IA/FG: *2001*

(3) Registration of IA/FG: [ ] Cooperative Act [ ] Association Act [ ] None

(4) Number of Present Members: *33* People (Male *26* people, Female *7* people)

(5) Area covered by IA/FG: _____ ha

2) Activities

(1) Frequency of Meetings;	Weekly	Monthly	Half yearly	Yearly	According Needs	No meeting	NA
General Meeting:	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Committees:	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Each canal group:	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

(2) Documentation of Meeting Results: [ ] Done [ ] Not done

(3) Major Issues Discussed and Decisions Made: _____

(4) Have by-laws and regulations been adopted: [ ] Yes [ ] No [ ] Intended

(5) Does IA/FG have a bank account? [ ] Yes [ ] Cash in hands [ ] Others [ ] NA

(6) Is book-keeping prepared? [ ] Yes [ ] No [ ] No Answer

3)Farmers' Contribution to the Construction/Repair Works

(1) Construction Works:	[ ] In Kind	[ ] In cash	[ ] None
(2) Repair Works:	[ ] In kind	[ ] In cash	[ ] None

Form-3 Survey Sheet for Interview Survey with Stakeholders (3/3)

Sub-step 3(c) Present Conditions of Environment

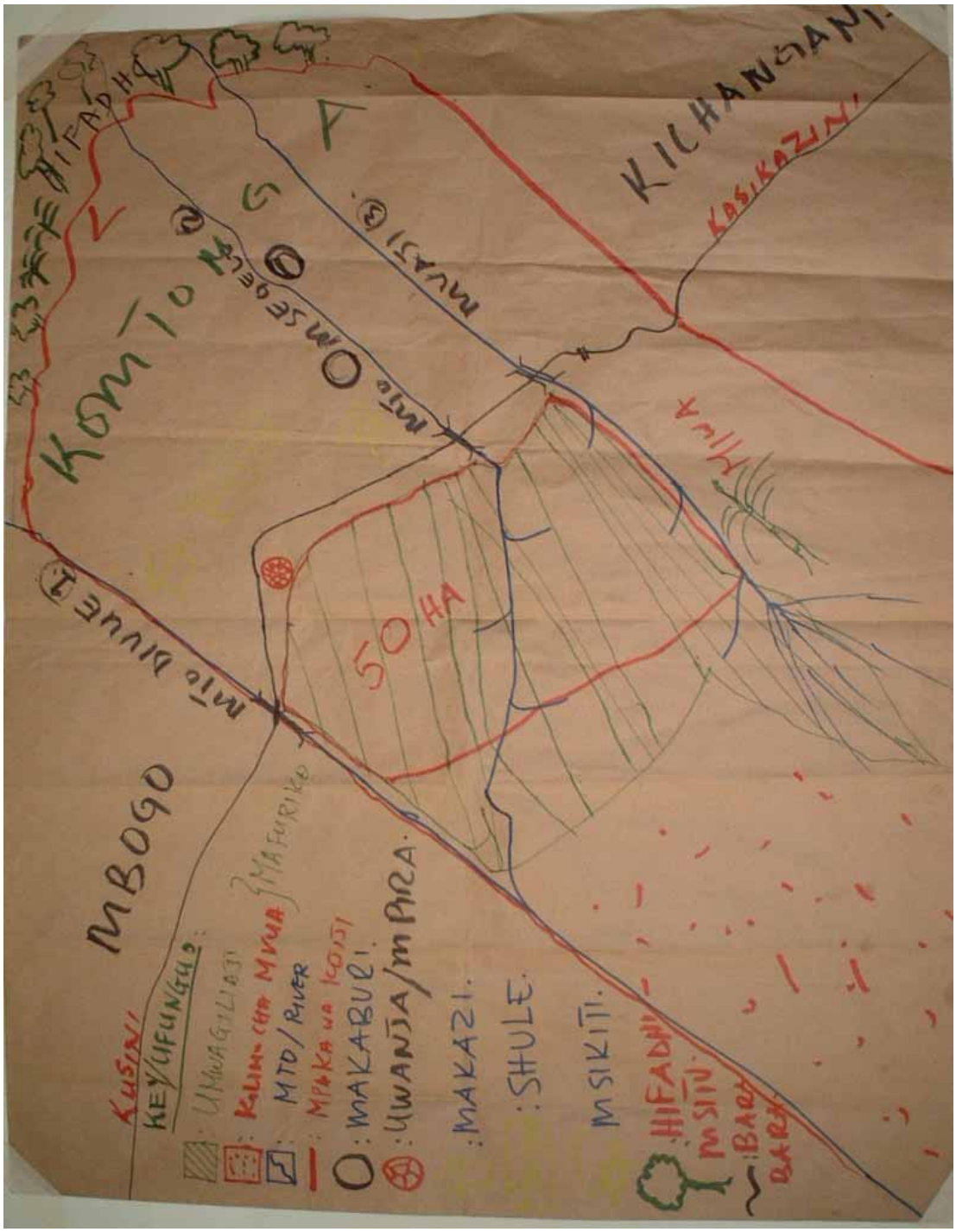
Applicability The sub-step should be applied to all schemes.

1) Physical Conditions | Scheme Name: *Komtonga* | Surveyed Date: *15/6/2004*

(1) Siltation:	[X] Significant	[ ] Not significant	[ ] Not known
(2) Soil erosion:	[ ] Significant	[X] Not significant	[ ] Not known
(3) Salinity problem:	[ ] Significant	[X] Not significant	[ ] Not known
2) Change in Ecosystems			
(1) Vegetation degradation:	[ ] Significant	[X] Not significant	[ ] Not known
(2) Destructive animals:	[ ] Significant	[X] Not significant	[ ] Not known
(3) Aquatic plants:	[ ] Significant	[X] Not significant	[ ] Not known
3) Agricultural Activity			
(1) Water use conflict:	[X] Significant	[ ] Not significant	[ ] Not known
(2) Land use conflict:	[ ] Significant	[X] Not significant	[ ] Not known
(3) Loss of soil fertility:	[ ] Significant	[X] Not significant	[ ] Not known
4) Sanitation and Public Health			
(1) Soil and water pollution:	[ ] Significant	[X] Not significant	[ ] Not known
(2) Water borne diseases:	[X] Significant	[ ] Not significant	[ ] Not known
5) Socio-economic Conditions			
(1) Population increase (immigrant)	[ ] Significant	[X] Not significant	[ ] Not known
(2) Increase in water demand:	[X] Significant	[ ] Not significant	[ ] Not known
(3) Vandalism of structures:	[ ] Significant	[ ] Not significant	[ ] Not known

Note: Next step of page 3-15 (d) should be continued.

Village Resource Map - Komtonga Scheme -



Form-4 Survey Sheet for Field Condition Confirmation (1/7)

Sub-step 1 Confirm Soil Texture of the Proposed area

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

[O] Gravity [O] Pump (River) [O] Pump (Lake/pond) [O] Rain water harvesting

2) Type of irrigation development

[O] Rehabilitation [O] Improvement [O] New Development [O] Extension [ ] Drainage

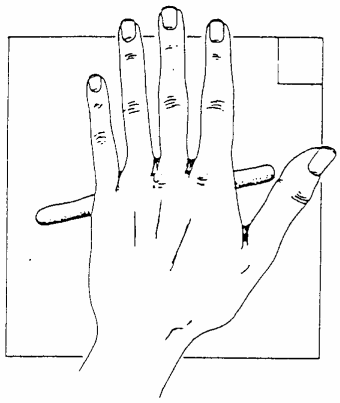
Instruction	Scheme Name	*Komtonga*	Surveyed Date	*15/6/2004*

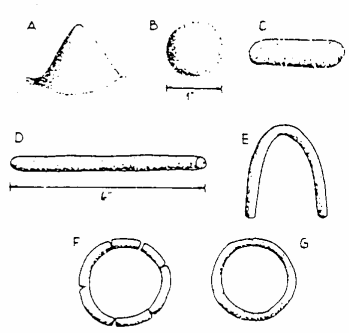
1) Visit the survey together with village chief and villagers.
Visit the proposed area and choose typical soil in the area with the consultation of the village chairperson and villagers.

2) Sampling of the soil
Gather a soil sample from the soil surface (sample should be about 10 x 10 x 10 cm).

3) Knead the soil with water.
Add some water to the soil sample so it is moist but not wet. Knead it well. Pebbles should be removed.

4) Try to create ring shapes with the soil sample and choose the most advanced shape that can be made.





A: Soil can only be shaped into a cone. No other shapes hold together.
B: Soil can be formed into a circle, but not a rod shape.
C: Soil can be formed into a stout rod shape.
D: A thin rod (about 6 mm diameter) can be formed but not bent.
E: Thin rod can be bent without breaking
F: Circle can be formed with some breaks.
G: Complete circle with no breaks can be formed.

5) Evaluate the soil texture
According to the result of 4), circle one of the detailed soil texture types and choose a general soil texture type by conversion of the detailed soil texture type.

Detailed soil texture type			conversion	General soil texture type	
Shape A	Sand	[ ]	if you choose Shape A →	Sand	[ ]
Shape B	Loamy sand	[ ]	if you choose Shape B or C →	Sandy Loam	[ ]
Shape C	Silty Loam	[ ]			
Shape D	Loam	[ ]	if you choose Shape D or E →	Clay Loam	[X]
Shape E	Clay Loam	[X]			
Shape F	Light Clay	[ ]	if you choose Shape F or G →	Clay	[ ]
Shape G	Heavy Clay	[ ]			

6) Notable Soil Characteristics
If there are any notable soil characteristics such as high rock outcrop, shallow soil depth and symptom of salt accumulation, please note.
Note:

Form-4 Survey Sheet for Field Condition Confirmation (2/7)

Sub-step 2 Confirm Field Drainage Condition				
Applicability The sub-step can be skipped for non-circled type of scheme				
1) Type of irrigation [O] Gravity [O] Pump (River) [O] Pump (Lake/pond) [O] Rain water harvesting				
2) Type of irrigation development [O] Rehabilitation [O] Improvement [O] New Development [O] Extension [O] Drainage				
Instruction	Scheme Name	*Komtonga*	Surveyed Date	*15/6/2004*
1) Interview with farmers Inundation of proposed area in normal year *75* cm depth for *1-2* days Highest flood water depth in the past *>100* cm depth in (10-50 years)				

Form-4 Survey Sheet for Field Condition Confirmation (3/7)

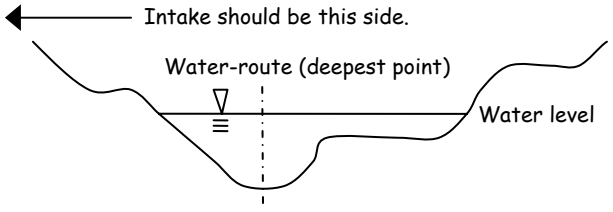
Sub-step 3 Confirm Bridge and River Crossing Condition				
Applicability The sub-step can be skipped for non-circled type of scheme				
1) Type of irrigation [O] Gravity [O] Pump (River) [O] Pump (Lake/pond) [O] Rain water harvesting				
2) Type of irrigation development [O] Rehabilitation [O] Improvement [O] New Development [O] Extension [O] Drainage				
Instruction	Scheme Name	*Komtonga*	Surveyed Date	*15/6/2004*
1) Observe bridge or river crossing point				
River crossing point(s)	Number _____ nos. Total length _____ m Survey river crossing point(s) where provision of bridge is required.			
Existing bridge(s)	Number _____ nos. Total length _____ m [ ] 100 % replacement [ ] 50 % replacement [ ] 30 % replacement [ ] minor rehabilitation [X] functioning well [ ] Facility not exist			

Form-4 Survey Sheet for Field Condition Confirmation (4/7)

Sub-step 4 Confirm Intake Point Condition				
Applicability The sub-step can be skipped for non-circled type of scheme				
1) Type of irrigation [O] Gravity [ ] Pump (River) [O] Pump (Lake/pond) [O] Rain water harvesting				
2) Type of irrigation development [O] Rehabilitation [O] Improvement [O] New Development [O] Extension [O] Drainage				
Instruction	Scheme Name	*Komtonga*	Surveyed Date	*15/6/2004*

1) Determine intake point

Determine intake point (location of the weir). The intake point should be narrow, strait, moderate (not too gentle) steep (to avoid siltation), stable flow, intake side water-route (see figure in the right), geologically strong and have easy access.



Elevation of the intake point should not be very different from the elevation at the

upstream-end of the command area of the main canal (see **Figure-2**). If you cannot find a suitable intake point, search upstream on the same river or change the water source to another river (if there is one). If you still cannot find a suitable place, because of flat river bed, go to 2) and choose "Seems No Good".

2) Evaluate reliability of the intake water level

Evaluate the reliability of the determined intake water level by referring to **Figure-2**. If you are not sure about the relationship between intake water level and the elevation of the proposed area, choose "Not sure".

[X] Seems Good [ ] Not sure [ ] Seems No Good

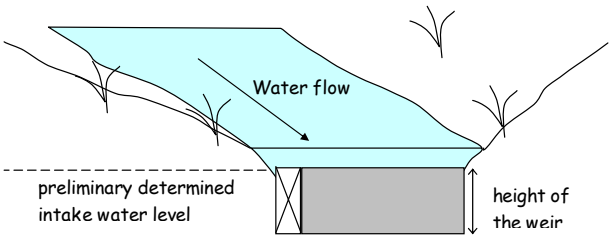
If it seems No Good, give up to irrigate the upstream part of the development area and find some lower land with elevation almost the same as the highest possible intake water level of the point.

3) Estimate intake water level

Estimate the intake water level (water level at the beginning point of the main canal). The intake water level should be almost the same or at a higher elevation than the upstream-end of the command area of the main canal. The water level should also be able to give some water depth for the main canal flow.

4) Estimate weir height

The elevation of the weir crest should be preliminarily determined as the same level as the intake water level. Estimate the weir height considering depth of the river at the intake point.



Estimated weir height (h) | *1.2* | m

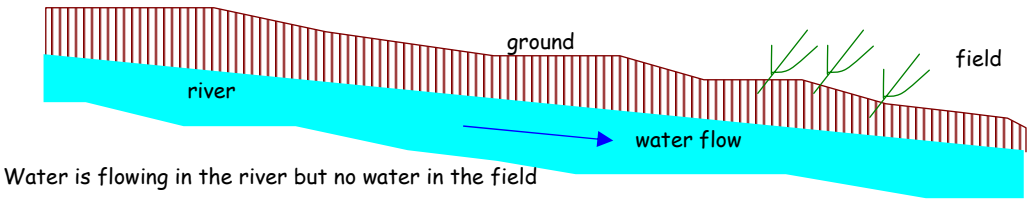
5) Measure river width and depth at the intake point

Width of river at the intake point | *3* | m

Depth of river at the intake point | *1.2* | m

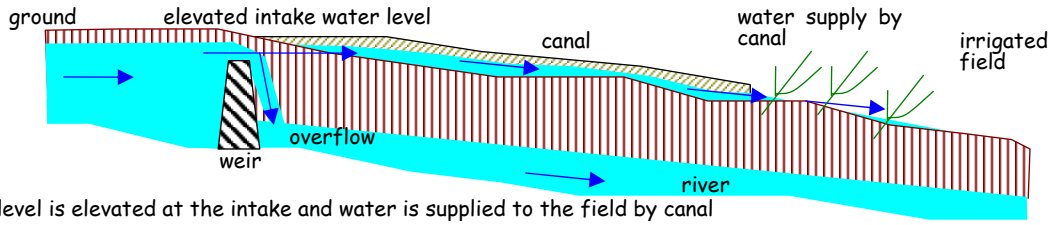
Figure-2 Required Intake Water Level

Before irrigation (profile along the water source river)



Water is flowing in the river but no water in the field

After irrigation (profile of the water source river and canal)



Water level is elevated at the intake and water is supplied to the field by canal

Form-4 Survey Sheet for Field Condition Confirmation (5/7)

Sub-step 5 Confirm Water Source River Condition

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

[O] Gravity [O] Pump (River) [ ] Pump (Lake/pond) [O] Rain water harvesting

2) Type of irrigation development

[O] Rehabilitation [O] Improvement [O] New Development [O] Extension [ ] Drainage

Instruction	Scheme Name	*Komtonga*	Surveyed Date	*15/6/2004*

1) Determine measurement point together with village chief and villagers

Find a suitable point for measurement together with the villagers. The measurement point should be a) narrow, b) strait, c) steep, and d) upstream of any existing intake, or e) near the proposed intake site. In case of pump (lake/pond), major inflow to the lake/pond should be the measured, if there is any. If there is no major inflow, proceed to sub-step 3.

2) Estimate flow area on the day of survey

Measure average river width and water depth on the day of survey.

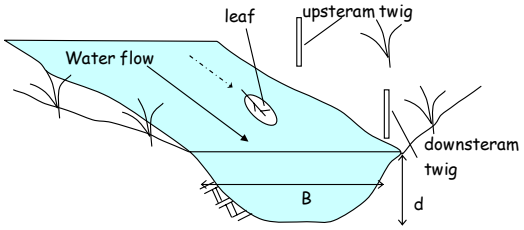
B = [*3.15*] m (average river width) Dt= [*0.45*] m (water depth today)

At= [*1.42*] m^2 (flow area of today) (At = B x Dt)

3) Measure water flow velocity of the day

a) Drive two twigs into the ground beside the river at a measured distance between the two twigs. b) Float a leaf on the water from the upstream twig to the downstream twig and measure the travel time.

c) Calculate the flow velocity.



Ls = [*3*] m (length between twigs) Tt= [*5*] sec (consumed time)

Vt = [*0.6*] m/sec (V t = Ls/ Tt)

4) Calculate river discharge on the day of survey

Qt= [0.852] m/sec (discharge on the day of survey) (Qt = At x Vt)

5) Estimate water depth at critical/average month in dry and rainy season

For gravity, pump (river) and rain water harvesting scheme, ask villagers when are the *critical months* (month in which most drought occurs) for rainy and dry season. Obtain water depth in those months by interviewing the villagers.

For pump irrigation, obtain water depth in *average discharge months* in each season.

Dry season Critical/average month [*Sep*] [*0.3*] m (Dd; water depth)

Rainy season Critical/average month [*May*] [*0.45*] m (Dr; water depth)

6) Water flow month

Dry season from [ ] to [ ]

Rainy season from [ ] to [ ]

7) Estimate discharge at critical/average month in dry and rainy season

Qd= [*0.568*] m^3/sec (Qd = Qt / Dt x Dd)

Qr= [*0.852*] m^3/sec (Qr = Qt / Dt x Dr)

8) Nominate river discharge record keeper

One villager who lives near the water source river should be nominated as the river discharge record keeper by the village chairperson. The keeper should measure the water level and velocity of the measurement point once every month.

Nominated name of the record keeper [ ]

Form-5 Calculation Sheet for Irrigation Water Requirement

Sub-step 1 Estimate Gross Water Requirement

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/06/2004*

1) Determine crops to be irrigated

Determine the crops to be irrigated considering present crop production surveyed in **Form-3 (1/3)**, the agro-ecological zone obtained from the irrigation GIS, and the farmers' intentions for cropping after the scheme is implemented.

Choose one crop for dry season and rainy season respectively.

Dry season:	[X]	Paddy	[ ]	Maize	[ ]	Beans and Vegetables
Rainy season:	[X]	Paddy	[ ]	Maize	[ ]	Beans and Vegetables

2) Setting-up a typical cropping calendar

In order to simplify the water requirement calculation, the typical, ideal cropping calendar under irrigated conditions was established in the Action Plan study. This calendar, as shown below, was based on the following conditions.

- The major strategic crop for the irrigation development is paddy and the effective utilization of the long rains between March and May (Masika) is the key issue.
- Since irrigated conditiond are assumed, the land preparation can be performed within 1 month and the rainy season cropping can thus be started around January.
- In this case, the harvesting can be carried out around June and that period is ideal for the harvest of paddy because of the dry conditions just after the long rains.
- The double cropping of paddy will be possible if the irrigation water is available during the dry season starting from July.
- Even if the irrigation water is not sufficient during the dry season, some crops can be grown under the effective utilization of the remaining soil moisture.

Typical Cropping Calendar

Seasons	Dry season cropping						Rainy Season cropping					
	1st	2nd	3rd	4th	5th	6th	1st	2nd	3rd	4th	5th	6th
Month	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun

3) Enter net unit water requirement (NWR)

Obtain net unit water requirement (NWR) from **Table-1**. General soil texture type is confirmed from **Form-4 (1/7).**

4) Obtain irrigation efficiency (E)

Obtain suitable irrigation efficiency from **Table-2**.

Irrigation efficiency (E)
0.4

5) Calculate gross unit water requirement (GWR)

Calculation Form of Gross Unit Water Requirement (Unit: mm/month)

		Dry season						Rainy season					
Crop to be irrigated													
Name of the Month		1st Jul	2nd Aug	3rd Sep	4th Oct	5th Nov	6th Dec	1st Jan	2nd Feb	3rd Mar	4th Apr	5th May	6th Jun
Net unit water requirement (mm/month)	Table-1	*422*	*300*	*335*	*330*	-	-	*468*	*305*	*271*	*175*	*226*	-
Gross unit water requirement (GWR) (l/sec/ha)	NWR/E /8.64/ D*	*3.94*	*2.89*	*3.13*	*3.08*	-	-	*4.37*	*3.04*	*2.53*	*1.69*	*2.11*	-

*D :number of days by the month,

Form-6(a) Calculation Sheet for Water Balance Study (River)

Sub-step 1 Water balance calculation (river water source)

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

[O] Gravity [O] Pump (River) [ ] Pump (Lake/pond) [O] Rain water harvesting

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/06/2004*

1) Obtain river discharge of the critical months

Obtain river discharge for the critical months of the rainy and dry seasons (Qd and Qr) from **Form-4 (5/7)** and enter the values into the calculation form below. For other months, enter "-".

2) Calculate 80% dependable river discharge

Calculate 80% dependable river discharge by multiplying Qd and Qr by 0.6.

3) Obtain and enter gross unit water requirement (GWR)

Obtain gross unit water requirement (GWR) for 12 months from **Form-5** and enter the value in the calculation form below.

4) Calculate irrigable area in the dry and rainy season

Calculate the irrigable area of each month and determine the irrigable area in the rainy season and dry season using the following calculation form.

Calculation Form of Water Balance Study (River) (Unit: m^3/sec)

		Dry season						Rainy season					
Month		1st Jul	2nd Aug	3rd Sep	4th Oct	5th Nov	6th Dec	1st Jan	2nd Feb	3rd Mar	4th Apr	5th May	6th Jun
River discharge (1)		-	-	*0568*	-	-	-	-	-	-	-	*0852*	-
80% dependable river discharge (2)	(1) x 0.6	-	-	*0.34*	-	-	-	-	-	-	-	*0.51 1*	-
GWR (3)		*3.94*	*2.89*	*3.13*	*3.08*	-	-	*4.37*	*3.04*	*2.53*	*1.69*	*2.11*	-
Irrigable Area (ha) in the month (4)	(2)/(3) x 1000	-	-	*108*	-	-	-	-	-	-	-	*242*	-
Irrigable Area (ha) in the season	minimum of (4) in the season	*108*						*242*					

Note: (1) If river discharge data is available for only one month of each season, the water balance can only be made for that month.

(2) If water requirement in the critical month is "-", shift the critical month to the nearest month for which water requirement is available.

4) Determine development area (area to be provided with irrigation facilities)

Obtain the size of the proposed area from the present situation map by counting the squares in the map. Compare the area of the proposed area with the irrigable area in the rainy season; the smaller value should be chosen as the development area.

Proposed area (i)	*50*	ha
Irrigable area in rainy season (ii)	*242*	ha
Development area (smaller value of (i) and (ii))	*50*	ha

Form-7 Planning Sheet for Scheme Development Plan (1/10)

Sub-step 1(a) Preliminary Design and Cost Estimate of Weir

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

[O] Gravity [ ] Pump (River) [ ] Pump (Lake/pond) [O] Rain water harvesting

2) Type of irrigation development

[O] Rehabilitation [O] Improvement [O] New Development [ ] Drainage

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/06/2004*

1) Plot intake point on the present situation map

Plot the intake point on the present situation map.

2) Estimate width of the river at intake point

Obtain width of the river at intake point and height of the weir from **Form-4 (4/7)**.

Width of the river (W)	*3.0*	m
Height of the weir (h)	*1.2*	m

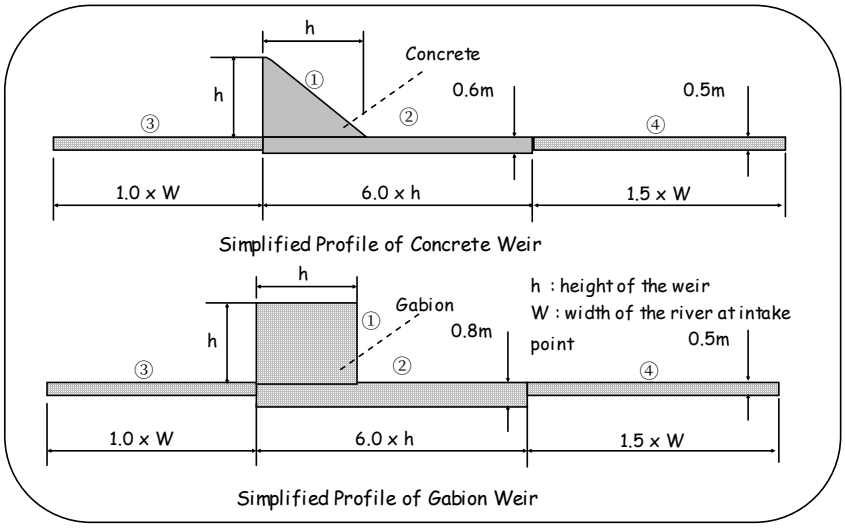
3) Choose type (material) of the weir

Choose concrete type weir if budget for that is available. If not, start the scheme with a gabion type weir. Circle one at right.

[X] Concrete Type
[ ] Gabion Type

4) Estimate work quantity of construction

Estimate work quantity of construction by using the chart at right.



a) Work quantity of concrete weir (if you choose gabion type, proceed to b))

Concrete volume (i)	h x h / 2 x W + 6 x h x 0.6 x W =	*15.12*	m^3
Gabion volume (ii)	1 x W x 0.5 x W + 1.5 x W x 0.5 x W =	*11.25*	m^3

b) Work quantity of gabion weir

Gabion volume (ii)	h x h x W + 6 x h x 0.8 x W + 1 x W x 0.5 x W + 1.5 x W x 0.5 x W =		m^3

5) Estimate construction cost of the weir

Obtain work quantity from 4) and estimate construction cost by multiplying unit cost.

Concrete volume (i)	*15.12* m^3	x Unit cost	300,000	Tsh/m^3	=	*4,536,000*	Tsh
Gabion volume (ii)	*11.25* m^3	x Unit cost	45,000	Tsh/m^3	=	*506,250*	Tsh

(1) Cost of weir body (Sub total (i + ii))	*5,042,250*	Tsh
(2) Miscellaneous works and contingency (50% of (1))	*2,521,125*	Tsh
(3) Cost for new weir ((1) + (2))	*7,563,375*	Tsh

(4) Extent of required replacement
For new development or improvement scheme, enter factor 1.0. For rehabilitation scheme, choose extent of required replacement (1.0(=100%), 0.5 or 0.3) from **Form-4 (7/7)**. Minor rehabilitation can be omitted. | *1.0*

(5) Construction/Rehabilitation cost of the weir (3) x (4) | *7,563,375* | Tsh

Form-7 Planning Sheet for Scheme Development Plan (3/10)

Sub-step 1(c) Preliminary Design and Cost Estimate of Main Canal System

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation
O Gravity O Pump (River) O Pump (Lake/pond) O Rain water harvesting

2) Type of irrigation development
O Rehabilitation O Improvement O New Development Drainage

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/06/2004*

1) Obtain length of the main canal
Seek preliminary route of the main canal, if there is no existing main canal. The route can be obtained to follow more or less the same elevation as the upstream-end of the command area of the main canal towards the intake site. Plot the route of the main canal on the present situation map and measure its length.

2) Obtain command area of the main canal
Obtain the command area of the main canal. Not only the development area for this DADP, which was determined in the **Form-6 (a) or (b),** but all the area that water is supplied by the main canal should be the command area of the main canal.

Command area of the main canal: *50* ha

3) Choose type of the main canal
Choose the type of main canal. If the budget is limited or future expansion is planned, choose unlined canal, considering future enlargement of the canal capacity. If not, choose lined canal, since it needs less maintenance work. Circle one option at right.

( ) Lined canal
(X) Unlined canal

4) Estimate construction cost of the main canal system
Estimate the construction cost for the main canal and structures based on the length of the main canal and the unit cost classified by command area and type of canal.

a) Basic cost of the main canal system
Length of canal *1900* *m* x Unit cost *6000* Tsh/m = *11,400,000* Tsh (i)

Unit cost to be applied for new development and improvement			
Command area (A) (ha)	Unlined canal	Lined canal	
A > 200ha	18,500	33,500	Tsh/m
100 ≤ A <200	11,000	21,000	Tsh/m
50 ≤ A <100	6,000	12,800	Tsh/m
A <50	4,500	10,000	Tsh/m

For a rehabilitation scheme, obtain the extent of required replacement of the main canal and structures from **Form-4 (7/7)**. The unit cost for a rehabilitation scheme can be estimated by multiplying the extent of required replacement (1.0(=100%), 0.5 or 0.3) by the unit cost for a new development and improvement. Minor rehabilitation can be omitted.

b) Contingency (10% of (i))	(ii)	*1,140,000*	Tsh
c) Construction/rehabilitation cost of the main canal system (i + ii)		*12,540,000*	Tsh

Form-7 Planning Sheet for Scheme Development Plan (4/10)

Sub-step 1(d) Cost Estimate of Irrigation Facilities in the Development Area

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

[O] Gravity [O] Pump (River) [O] Pump (Lake/pond) [O] Rain water harvesting

2) Type of irrigation development

[O] Rehabilitation [O] Improvement [O] New Development [ ] Drainage

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/6/2004*

1) Obtain development area

Obtain development area from **Form-6 (a) or (b)**.

2) Estimate construction cost of the irrigation facilities in the development area

Estimate the construction cost from the size of development area and unit cost.

a) Basic cost of the irrigation facilities in the development area

Development Area [*50*] ha x Unit cost [*750,000*] Tsh/ha = [*37,500,000*] Tsh (i)

Unit cost to be applied	New development and improvement	750,000 Tsh/ha

For rehabilitation scheme, obtain extent of required replacement of the secondary canals and structures from **Form-4 (7/7)**. The unit cost for a rehabilitation scheme can be estimated by multiplying the extent of required replacement (1.0(=100%), 0.5 or 0.3) by the unit cost for new development and improvement. Minor rehabilitation can be omitted.

b) Contingency (10 % of (i))	(ii)	*3,750,000*	Tsh
c) Construction/rehabilitation cost of the irrigation facilities in the development area (i + ii)		*41,250,000*	Tsh

Form-7 Planning Sheet for Scheme Development Plan (5/10)

Sub-step 1(e) Cost Estimate of Drainage Facilities in the Development Area

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

[O] Gravity [O] Pump (River) [O] Pump (Lake/pond) [O] Rain water harvesting

2) Type of irrigation development

[O] Rehabilitation [O] Improvement [O] New Development [O] Drainage

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/6/2004*

1) Obtain development area

Obtain development area from **Form-6 (a) or (b)**.

2) Estimate construction cost of the drainage facilities in the development area

Estimate construction cost from the size of the development area and unit cost.

a) Cost of the drainage facilities in the development area

Development Area [*50*] ha x Unit cost [*500,000*] Tsh/ha = [*25,000,000*] Tsh (i)

Unit cost to be applied	New development and improvement	500,000 Tsh/ha

For a rehabilitation scheme, obtain the extent of required replacement of the drainage canals and structures from **Form-4 (7/7)**. The unit cost for a rehabilitation scheme can be estimated by multiplying the extent of required replacement (1.0(=100%), 0.5 or 0.3) by the unit cost for new development and improvement. Minor rehabilitation can be omitted.

b) Contingency (10 % of (i)) (ii) *2,500,000* Tsh

c) Construction/rehabilitation cost of the drainage facilities in the development area (i + ii) *27,500,000* Tsh

Form-7 Planning Sheet for Scheme Development Plan (6/10)

Sub-step 1(f) Preliminary Design and Cost Estimate of Flood Dike

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

O Gravity O Pump (River) O Pump (Lake/pond) O Rain water harvesting

2) Type of irrigation development

O Rehabilitation O Improvement O New Development O Drainage

Instruction | Scheme Name: *Komtonga* | Planned Date: *23/6/2004*

1) Analyze necessity for providing flood dike

Obtain the inundation condition of the proposed area in the normal area from **Form-4 (2/7)**. If the water depth of inundation in a normal year is shallower than 50 cm or inundation continuers shorter than seven days, skip this sub-step and proceed to sub-step 6. If there is a risk of irrigation facilities being washed away by heavy flood, flood dike needs to be provided. The need for a flood dike can also be analyzed from **Table-6**.

Table-6 Loss of Paddy Production due to Poor Drainage

Stage	Condition	Duration (days)			
		1-2	3-4	5-7	more than 7
Tillering	Clean water	10%	20%	30%	35%
Booting	Muddy water	70%	80%	85%	90-100%
	Clean water	25%	45%	80%	90-100%
Heading	Muddy water	30%	80%	90%	90-100%
	Clean water	15%	25%	30%	70%
Ripening	Muddy water	5%	20%	30%	30%
	Clean water	0%	15%	20%	20%

2) Determine height of the flood dike if it is necessary

Obtain the highest flood level in the past from **Form-4 (2/7)**. Determine the required height of the flood dike by adding 0.5 m allowance (freeboard) to the highest flood level.

The highest flood level *1* m + 0.5 m = *1.5* m (Height of the flood dike)

3) Estimate length of the flood dike by using the scheme development plan map

Estimate required extent of the flood dike plotting it on the scheme development map. Measure the plotted length of the flood dike.

Length of the flood dike *400* m

4) Estimate construction cost of the flood dike

Estimate the construction cost from the length of the flood dike and unit cost, which is classified according height of the dike.

a) Cost of the flood dike

Length of the dike *400* m x Unit cost *41,000* Tsh/m = *16,400,000* Tsh (i)

Unit cost to be applied Height up to 2.0 m 67,000 Tsh/m

Height up to 1.5 m	41,000	Tsh/m
Height up to 1.2 m	26,000	Tsh/m

For a rehabilitation scheme, obtain the extent of required replacement of the flood dike from **Form-4 (7/7)**. The unit cost for a rehabilitation scheme can be estimated by multiplying the extent of required replacement (1.0(=100%), 0.5 or 0.3) by the unit cost for new development and improvement. Minor rehabilitation can be omitted.

b) Contingency (10 % of (i)) (ii) *1,640,000* Tsh

c) Construction/rehabilitation cost of the flood dike (i + ii) *18,040,000* Tsh

Form-7 Planning Sheet for Scheme Development Plan (7/10)

Sub-step 1(g) Preliminary Design and Cost Estimate of Village Access Road

Applicability The sub-step can be skipped for non-circled type of scheme

1) Type of irrigation

O Gravity O Pump (River) O Pump (Lake/pond) O Rain water harvesting

2) Type of irrigation development

O Rehabilitation O Improvement O New Development O Drainage

Instruction | Scheme Name | *Komtonga* | Planned Date | *23/6/2004*

1) Confirm route of the village access road on the present situation map

Confirm the route of the village access road on the present situation map and analyze whether it connects the main road – development area – village – intake. If not, an additional road should be proposed. The additional road should be plotted on the present situation map using a different type of line.

2) Measure length of the village access road

Measure the length of existing and proposed village access roads on the present situation map.

3) Estimate construction cost of the village access road

Estimate construction cost from total length of the village access road and unit cost.

Total length *1900* m x Unit cost *7,000* Tsh/m = *13,300,000* Tsh

(↑ Unit cost to be applied; ↑ Construction/reha-bilitation cost of village access road)

Unit cost to be applied	New development and improvement	7,000	Tsh/m

For a rehabilitation scheme, obtain the extent of required replacement of the village access road from **Form-4 (7/7)**. The unit cost for a rehabilitation scheme can be estimated by multiplying the extent of required replacement (1.0(=100%), 0.5 or 0.3) by the unit cost for new development and improvement. Minor rehabilitation can be omitted.

Village access road improvement is assumed to be surface treatment only.

Form-7 Planning Sheet for Scheme Development Plan (9/10)

Sub-step 1(i) Estimation of Total Construction Cost				
Instruction	Scheme Name	*Komtonga*	Planned Date	*23/6/2004*

1) Estimate total construction/rehabilitation cost

Obtain the total construction cost by summing up the costs on **Form-7 (1/10)** to **(8/10)**

(1a) Weir	*7,563,375*	Tsh
(1b) Pump	-	Tsh
(2) Main canal & structures	*12,540,000*	Tsh
(3) Irrigation facilities in the development area	*41,250,000*	Tsh
(4) Drainage facilities in the development area	*27,500,000*	Tsh
(5) Flood Dike	*18,040,000*	Tsh
(6) Village Access Road	*13,300,000*	Tsh
(7) Village Bridge	-	Tsh
Total Construction Cost (sum of (1a) to (7))	*120,193,375*	Tsh

Form-7 Planning Sheet for Scheme Development Plan (10/10)

Sub-step 1(j) Scheme Development Cost Estimate				
Instruction	Scheme Name	*Komtonga*	Planned Date	*23/6/2004*

1) Estimate scheme development cost

Obtain total construction cost from **Form-7 (9/10)** and estimate the relevant costs.

(1) Total construction cost		*120,193,375*	Tsh
(2) Soft component cost	6.0% of (1)	*7,211,603*	Tsh
(3) Administration cost	4.0% of (1)	*4,807,735*	Tsh
(4) Engineering services cost	30.0% of (1)	*36,058,013*	Tsh
(5) Operation and maintenance (O&M) cost	1.5% of (1)	*1,802,901*	Tsh
(6) Replacement cost	2.0% of (1)	*2,403,868*	Tsh
Scheme development Cost		*172,477,495*	Tsh

Note: Soft component cost includes cost for institutional development (such as irrigators' association establishment) and strengthening of extension services.
Administration cost includes incremental cost of governmental administration for the scheme.
Engineering services cost includes survey, design and construction supervision.

Form-8 Scheme Incremental Benefit Estimation Sheet (1/2)

Sub-step 1 Scheme Benefit Estimate

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/6/2004*

The scheme incremental benefit should be estimated for the **development area** determined through the water balance study with and without project condition in the following manner.

1) Without project condition (present condition)

a) Estimate benefit during Rainy season

Rainy season crop		Average Yield (kg/ha)		Average Price (Tsh/kg)		Cropped Area in Development Area (ha)		Benefit (Bro) (Tsh)
1) *Paddy*	x	*194*	x	*1,000*	x	*50*	=	*9,700,000*
2)	x		x		x		=	

b) Estimate benefit during dry season

Dry season crop		Average Yield (kg/ha)		Average Price (Tsh/kg)		Cropped Area in Development Area (ha)		Benefit (Bdo) (Tsh)
1) *Paddy*	x	*130*	x	*1,500*	x	*50*	=	*9,750,000*
2)	x		x		x		=	

c) Estimate total benefit without project Bro1+Bro2+Bdo1+Bdo2 *19,450,000* (I)

Without project condition data should be derived from the survey sheet of **Form-3 (1/3)** and be calculated in the following manner.

Average Yield and Average Price for Cereals:

Average Yield (kg/ha) = (((Max. Yield + Min. Yield) / 2) x Weight/bag) x 2.5

Average Price (Tsh/kg) = ((Max. Price + Min. Price) / 2) / Weight/bag

Average Yield and Average Price for Vegetables:

Average Yield (kg/ha) = ((Max. Yield + Min. Yield) / 2) x 2.5

Average Price (Tsh/kg) = (Max. Price + Min. Price) / 2

Cropped Area in the Development Area:

This can be estimated from the cropped area in the proposed area shown in the present situation map by applying the percentage for each crop.

Cropped Area in Development Area (ha)

= Percentage shown in the present situation map x Size of Development Area

Form-8 Scheme Incremental Benefit Estimation Sheet (2/2)

2) With project condition (after project implementation)

a) Estimate benefit during rainy season

Rainy season crop		Average Yield (kg/ha)		Average Price (Tsh/kg)		Development area (ha)		Benefit (Brw) (Tsh)
Paddy	x	*194*	x	*4,500*	x	*50*	=	*43,650,000*

b) Estimate benefit during dry season

Dry season crop under irrigation		Average Yield (kg/ha)		Average Price (Tsh/kg)		Irrigable Area in Dry Season (ha)		Benefit (Bdw1) (Tsh)
Paddy	x	*130*	x	*4,500*	x	*50*	=	*29,250,000*

Dry season crop under rainfed		Average Yield (kg/ha)		Average Price (Tsh/kg)		Non-irrigable Area in Dry Season (ha)		Benefit (Bdw2) (Tsh)
			x		x		=	

c) Estimate total benefit with project (Brw)+(Bdw1)+(Bdw2) *72,900,000* (II)

The with project condition data should be elaborated by the DPDT under the careful consideration of cropping intensity. The irrigable area in the rainy and dry seasons should be effectively utilized and the strategic crop should be determined. In addition, the non-irrigable area in the dry season (development area – irrigable area in dry season) should also be utilized for the effective utilization of remaining soil moisture. Although there might be several candidate crops for the dry season, the major crops under irrigation and rainfed conditions should be selected respectively. Average yield should also be estimated through various data. For example, the target yield of paddy was set as follows in the Action Plan study. Average price can basically be maintained as without project condition.

Type of Development	Present Yield (t/ha)	Target Yield (t/ha)
From rainfed condition to water harvesting or improved traditional	1.0-3.0	3.0-4.0
From traditional or poorly developed condition to improved traditional	3.0-4.5	4.5-5.5
From improved traditional or moderately developed condition to modern with full input	4.5-5.5	6.0-7.0

3) Obtain incremental agricultural benefit

Incremental agricultural benefit (II) – (I) *53,450,000*

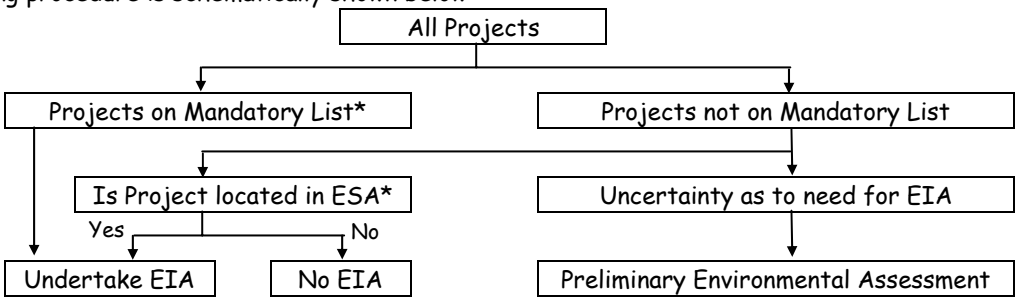
Note: In order to simplify the calculation process and also they are in the relation of offset, the production cost was neglected for the current estimation of agricultural benefit.

Form-10 Supplemental Information on Environmental Consideration

Sub-step 1 Screening

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/6/2004*

Screening procedure is schematically shown below:



Classify the proposed scheme in one of the following decisions through the screening procedure:

(1) [ ] EIA is required where the project is known to have significant adverse environmental impacts.
(2) [X] Preliminary environmental assessment is required where the project may have environmental impacts.
(3) [ ] EIA is not necessary where the project is unlikely to cause significant environmental impacts.

Note: Mandatory List (Agriculture)

- Cultivating natural and semi-natural not less than 50 ha,
- Water management projects for agriculture (drainage, irrigation),
- Large scale monoculture (cash and food crops),
- Pest control projects,
- Fertilizer and nutrient management,
- Agricultural programmes necessitating the resettlement of communities, and
- Introduction of new breeds of crops.

Note: ESA (Environmentally Sensitive Areas)

- Areas prone to natural disasters, - Wetlands, - Mangrove swamps,
- Areas susceptible to erosion, - Areas of importance to threatened cultural groups,
- Areas with rare/endangered/or threatened plants and animals,
- Areas of unique socio-cultural, archaeological or scientific significance and areas with potential tourist value,
- Polluted area, - Area subject to desertification and bush fires, - Coastal areas/Marine ecosystems,
- Areas declared as national park, watershed reserve, forest reserve, game reserve, wildlife corridors,
- Mountainous areas, water catchment areas and recharge areas of aquifers,
- Areas classified as prime agricultural lands or range lands,
- Green belts or public open spaces in urban area, - Burial sites and graves.

Sub-step 2 Proposed Scheme in Protected Areas

Instruction	Scheme Name	*Komtonga*	Planned Date	*23/6/2004*

Confirm whether the proposed scheme is located in a protected area or not:

As mentioned in Step-4 and Step-5(a), the information on protected areas and the distribution of surveyed schemes should be provided from the data and information management unit. Based on this information, check whether the proposed scheme is located in a protected area or not.

Proposed Scheme locates: [ ] Within the protected area [**X**] Outside the protected area

Proposed schemes in productive forest reserves:

If the proposed scheme is located in a productive forest reserve, it may be possible to alter part of the land to another use (e.g. irrigation development). For such conversion, a request from the district authorities has to be submitted to the Permanent Secretary of the Ministry of Natural Resources and Tourism for careful examination and has to include the following:

- Information on intended land use for the piece of land requested within the productive forest reserve,
- Total area to be developed and the detailed development plan,
- The number of beneficiaries for the intended land use,
- Results of EIA in order to ascertain possible impacts of the intended project to the environment,
- A map, or at least a sketch, of the location of the intended scheme/project in relation to the forest reserve.

Form-11 Check List of the Scheme Development Plan

Sub-step 1 Confirm Irrigation Technical Plan	Scheme Name	*Komtonga*		
1) Water Balance (River Discharge)	Checked Date	*23/6/2004*		
a) Does obtained river discharge seem reliable? (if the data is doubtful such as too much discharge in dry season, choose NO)	X	YES		NO
2) Weir and Intake				
(Reliability of intake water level) a) Does elevation of weir crest top seem to be higher than elevation of upstream end of the development area (can be obtained from **Form-4 (4/7)**)?	X	YES		NO
		NOT SURE		
b) Does the intake site have a narrow, strait, moderate slope (not too gentle), stable flow and easy access point?	X	YES		NO
3) Main Canal				
a) Does the planned main canal route connect the command area of the main canal and the intake site with a gentle slope (or almost same elevation), unless there is special suitable location for weir, such as small waterfall, etc.?	X	YES		NO
b) Has the length of the main canal plotted on the scheme development plan map been measured by using ruler?	X	YES		NO
4) Flood Dike				
a) Is the length of the planned flood dike enough to protect the development area from floods?	X	YES		NO
b) Has the length of the flood dike plotted on the scheme development plan map been measured by using ruler?	X	YES		NO
5) Village Access Road				
a) Does the planned village access road connect the main road – village – development area – intake site?	X	YES		NO
b) Has the length of the village access road plotted on the scheme development plan map been measured by ruler?	X	YES		NO
6) Village Bridge				
a) Is the total length of village bridges enough for crossing the river?	X	YES		NO
Sub-step 2 Confirm Agricultural Information	Checked Date	*23/6/2004*		
(Information on scheme benefit estimate) In case the result of benefit estimation is considered inappropriate, the following information should be reconfirmed.				
a) Cropped Area: With special attention to the difference in the cropped area between the rainy and dry seasons.	X	YES		NO
b) Average Yield: With special attention to adjusting the unit (bag/acre to kg/ha) and proposed yield with project.	X	YES		NO
c) Average Price: With special attention to obtaining the price for an ordinary year.	X	YES		NO

The item for reconfirmation is a sample only. All the data and information should be checked.

If there is answer NO, the data should be reconfirmed on site.

In case the data is replaced with new data, revise the survey sheet and repeat Step-6.

Form-12 Schemes Prioritization Sheet

Only one Form-12 should be completed per district.

Name of the District: *Mvomero*

Indicators	*Criteria for Ranking*
Adequacy	a) Technical adequacy i) Reliability of intake water level (see **Form-11**), ii) availability of construction material, iii) availability of construction company b) Social adequacy i) villagers consensus, ii) farmers motivation c) Environmental adequacy (see **Form-10**) d) e)
Efficiency	a) IRR (Internal Rate of Return), etc. b) c)
Dependability	a) Performance of irrigators' association, b) Performance of farmers on group activities, etc. c) d)
Equity	a) Even distribution of land in the development area, b) No water conflicts between adjacent villages (over water rights), etc. c) d)

Enter 1 for the first ranked scheme, enter 2 for the second, ...

Name of the Scheme Selected	*Ranking*				*Final Ranking*
	Adequacy	*Efficiency*	*Dependability*	*Equity*	
Komtonga	1	1 (IRR26.1%)	1	1	1
Digoma	2	2 (IRR24.5%)	2	2	2
		(IRR____%)			
		(IRR____%)			

Box

Meanings of Adequacy, Efficiency, Dependability and Equity

(1) "Adequacy" means workability of the development plan or readiness for implementation. If the scheme is ready for implementation, "adequacy" is high.

(2) "Efficiency" means rate of investment and return. High return with low investment represents high "efficiency".

(3) "Dependability" means sustainability of the scheme. If farmers' performance in the scheme area is high, "dependability" is also high.

(4) "Equity" means even distribution of public properties. An even distribution of land in the scheme area indicates high "equity".

Form-13 Scheme Digest (Summary of Preliminary Planning for DADP) (1/2)

1. General Information | Prepared Date: *6/7/2004*

(1) Name of the scheme : *Komtonga*
(2) Name of the scheme in the Quick Site Inspection : *Komtonga*
(3) Location (any point in the scheme) : Latitude: *6 ° 10.142 S* Longitude: *37 ° 35.077 E*
(4) Administration : Ward *Sungaji*
: Village(s) *Komtonga*

2. Present Condition of the Development Area

2.1 Present Agricultural Conditions in the Development Area

(1) Present condition : ☐ Not Cultivated ☒ Cultivated (*50* ha in average year)
(2) Present crops : ☒ Paddy ☐ Maize ☐ Vegetable ☐ Others ( )
(3) Present markets : On farm (0 km from the site)
(4) Drainage problem : ☐ No problem ☒ Partially affected ☐ Strongly affected
(5) Flood : ☐ Scarce ☒ Once a year ☐ More than twice a year

2.2 Existing Irrigation System in the Development Area

(1) Current irrigation system : ☒ Traditional ☐ Improved traditional
☐ Modern ☐ Rainwater harvesting ☐ No irrigation
(2) Present irrigated area : *20* ha (if the scheme area is already irrigated)
(3) Main water source : ☐ Perennial river ☒ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain for water harvesting
(4) Name of the water source : *River Msengele*

2.3 Existing Institution (Association or Group) Related with Agriculture/Irrigation

(1) Establishment of Institution : ☐ Established in year ☒ Not established yet
(2) Name of the association :
(3) Registered year :
(4) Number of members : members

3. Development Plan

3.1 Irrigation System Development Plan

(1) Development area : *50* ha
(2) Main water source : ☒ Perennial river ☐ Seasonal river ☐ Lake/Pond
☐ Groundwater ☐ Spring ☐ Rain water harvesting
(3) Name of the water source : *River Divue*
(4) Water right : ☐ Granted ☐ Not granted yet ☒ Intended
(5) Required works : ☐ Rehabilitation ☐ New development
☒ Improvement (from traditional to modern) ☒ Drainage improvement
(6) Irrigation type : ☐ Gravity ☐ Pump ☐ Rain water harvesting
(7) Proposed facilities : Weir ☒ Concrete ☐ Gabion
(including : Pump nos.
rehabilitation) : Main canal km ☒ Lined ☐ Unlined
(except facilities in : Flood dike *0.35* km
the development : Village access road km
area) : Village bridge m in total

Form-13 Scheme Digest (Summary of Preliminary Planning for DADP) (2/2)

3.2 Agriculture Development Plan

(1) Dry season : Cropped area *50* ha ☒ Paddy ☐ Maize ☐ Vegetable

(2) Rainy season : Cropped area *50* ha ☒ Paddy ☐ Maize ☐ Vegetable

(3) Annual incremental annual agricultural benefit : 53,450,000 Tsh.

3.3 Institutional Development Plan

(1) Establishment : by year

(2) Type of organization : ☐ Irrigators' Association ☐ Farmers' Group

(3) Registration : by year

(4) Law : ☐ Association Act ☐ Cooperative Act

(5) Letter of undertaking : by year

3.4 Environment

☐ Water conflict within the scheme/village ☐ Water conflict with other scheme/village

☐ Land conflict ☐ Effect on protected area ☐ Soil erosion in the scheme

Cause of conflict ( )

EIA : ☐ Required ☒ Preliminary assessment is required ☐ Not required

Location : ☐ Within protected area ☒ Outside of protected area

3.5 Scheme development Cost

(1) Construction	*120,193,375*	Tsh.
(2) Soft component	*7,211,603*	Tsh.
(3) Administration	*4,807,735*	Tsh.
(4) Engineering	*36,058,013*	Tsh.
(5) O&M	*1,802,901*	Tsh.
(6) Replacement	*2,403,868*	Tsh.
TOTAL	*172,477,495*	Tsh.

Scheme development plan map should be attached.

Form-14 District Supporting Programme Digest

1) Title of the District Supporting Programme	*Planned Date*	*6/7/2004*
To improve farmers skills and knowledge on irrigation practices.		
2) Target Group (Who will benefit from the plan?)		
Farmers (Common farmers and Group target).		
3) Goal of the Programme (should be only one)		
(What is the outcome of the plan?)	(By when should it be achieved?)	
The principal of irrigation farming should be known by every farmers.	*Before the implementation work.*	

4) Activities (Required activities to achieve the goal of the programme)		
(Activities)	(Who will take action?)	(Time Schedule)
a) *Training (Resident)*		*First quarter* *10 days*
b) *Training (Field visit)*		*Second of Third quarter* *10 days*
c) *Training (Practice Training on site)*		*Last quarter* *10 days*

5) Inputs (Required inputs to conduct the activities)			
(Activities)	(Required Manpower)	(Required Equipment)	(Cost)
a)	*-District Extension Officer* *-D&MS - Irrigation*	*Vehicles Stationary*	*2,070,000/=*
b)	*-Crop Officers, Soil Scientist* *-Cooperative Officer*		
c)			
			(Total) *2,070,000*

Note: This sheet is applicable to present the plan for one programme.

Form-15 Summary of Irrigation Scheme Formulation Plan

Irrigation Scheme Formulation Plan for DADP		for Fiscal Year	*2004/2005*
Name of District	*Mvomero*	Planned Date	*23/6/2004*

1) Operation & Maintenance Cost and Replacement Cost for Schemes in Operation

List of schemes in operation (use additional sheet if there are more than three schemes)

(a) : Tsh.
(b) : Tsh.
(c) : Tsh.
TOTAL : Tsh. (I)

Required cost for scheme formulation planning for next DADP : Tsh. (II)

3) Scheme Development Plan

Name of the scheme *Komtonga Scheme*

1. Overall Scheme Development Cost (can be obtained from **Form-13**)

(1) Construction : *120,193,375* Tsh.
(2) Soft component : *7,211,603* Tsh.
(3) Administration : *4,807,735* Tsh.
(4) Engineering : *36,058,013* Tsh.
(5) O&M : *1,802,901* Tsh.
(6) Replacement : *2,403,868* Tsh.

2. Initial Investment Cost

(a) Initial investment cost : *168,270,726* Tsh. Total of (1) to (4) of 1.
(b) farmers' contribution : *18,029,006* Tsh. standard is 15% of 1-(1) (construction)
(c) by District government : *150,241,720* Tsh. (a) – (b)

3. Phase-wise Development Plan (should be finalized after Step-12)

(if there is no phase-wise development, enter all the initial investment cost (c) into Phase-1)

Phase-1 : *150,241,720* Tsh. in fiscal year *2004/2005*
Phase-2 : Tsh. in fiscal year
Phase-3 : Tsh. in fiscal year
Phase-4 : Tsh. in fiscal year
Phase-5 : Tsh. in fiscal year
TOTAL : *150,241,720* Tsh. (should be same as (c) in 2.)

Scheme development cost for this year *150,241,720* Tsh. (III)

4) District Supporting Programme

Title and cost of the plan (use additional sheet if there are more than three plans)

(a) *To improve farmers skills and knowledge on irrigation practices.* : *2,070,000* Tsh.
(b) : Tsh.
(c) : Tsh.
TOTAL : *2,070,000* Tsh. (IV)

5) Cost of Irrigation Scheme Formulation for DADP	*152,311,720*	Tsh. (total of (I)-(IV))

Scheme Development Plan Map - Komtonga Scheme -