The United Republic of Tanzania

The Comprehensive Guidelines

for Irrigation Scheme Development

Volume 2 Implementation

Fourth Revision May 2019

National Irrigation Commission (NIRC)
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SECTION 4 TECHNICAL GUIDANCE

SECTION 1 INTRODUCTION

Abbreviations

JICA	Japan International Cooperation Agency
A-CBG	Agricultural Capacity Building Grant
ASDP	Agricultural Sector Development Programme
ASDS	Agricultural Sector Development Strategy
ASPS	Agriculture Sector Programme Support
ASPS-IC	Agriculture Sector Programme Support – Irrigation Component
CDO	Community Development Officer
CBG	Capacity Building Grant
CBOs	Community Based Organizations
CMT	Council Management Team
DADG	District Agricultural Development Grant
DADP	District Agricultural Development Plan
DCT	District Core Team
DED	District Executive Director
D/D	Detailed Design
DDP	District Development Plan
DFT	District Facilitation Team
DIDF	District Irrigation Development Fund
DIMU	Data and Information Management Unit
DIDT	District Irrigation Development Team
DITS	Division of Irrigation and Technical Service
DPDT	District Project Development Team
DPLO	District Planning Officer
DIE	District Irrigation Engineer
EBG	Extension Block Grant
EC	Electric Conductivity
EIA	Environmental Impact Assessment
ESA	Environmental Sensitive Areas
ETo	Evapo -Transpiration
EIRR	Economic Internal Rate of Return
FAO	Food and Agriculture Organization (of the United Nations)
FIRR	Financial Internal Rate of Return
F/S	Feasibility Study
GIS	Geographic Information System
GPS	Global Positioning System
HIV/AIDS	Human Immunodeficiency Virus / Acquired Immunity Deficiency Syndrome
ICB	International Competitive Bidding
ISD	Irrigation Scheme Development
IO	Irrigators' Organization
IRR	Internal Rate of Return
ISID	Institutional Support to Irrigation Development Project

LGA	Local Government Authority
LGCG	Local Government Capital Development Grant
LoU	Letter of Undertaking
MAFC	Ministry of Agriculture, Food Security and Cooperatives
MOWI	Ministry of Water and Irrigation
NCB	National Competitive Bidding
NEMC	National Environmental Management Council
NGO	Non-Government Organization
NIRC	National Irrigation Commission
NIMP	National Irrigation Master Plan
O&OD	Opportunities and Obstacles to Development
O&M	Operation and Maintenance
PADEP	Participatory Agricultural Development and Empowerment Project
PAP	Participatory Action Planning
PDS	Participatory Diagnostic Study
PFAC	Planning Financial and Administration Committee
PFC	Planning and Financial Committee
PO-RALG	President's Office - Regional Administration and Local Government
RBM-SIIP	River Basin Management and Smallholder Irrigation Improvement Project
RC	Regional Commissioner
RS	Regional Secretariat
SDPMA	Smallholder Development Programme for the Marginal Areas
SMS	Subject Matter Specialist
SWOT	Strength, Weakness, Opportunity and Threat
TDV	Tanzania Development Vision
TOR	Terms of Reference
TIP	Traditional Irrigation Improvement Programme
UTM	Universal Transverse Mercator
VADP	Village Agricultural Development Plan
VAEO	Village Agricultural Extension Officer
VEO	Village Executive Officer
WAEO	Ward Agricultural Extension Officer
WDC	Ward Development Committee
WDP	Ward Development Plan
WEO	Ward Executive Officer
WFT	Ward Facilitation Team
RIO	Regional Irrigation Office
ZIE	Zonal Irrigation Engineer
ZIO	Zonal Irrigation Office
ZRC	Zonal Review Committee

Measurement Units

Extent

cm^2 = Square-centimeters (1.0 cm x 1.0 cm)
m^2 = Square-meters (1.0 m x 1.0 m)
km^2 = Square-kilometers (1.0 km x 1.0 km)
ha = Hectares (10,000 m2)
ac = Acres (4,046.8 m2 or 0.40468 ha.)

Volume

cm^3 = Cubic-centimeters
(1.0 cm x 1.0 cm x 1.0 cm or 1.0 m-lit.)
m^3 = Cubic-meters
(1.0 m x 1.0 m x 1.0 m or 1.0 k-lit.)
lit (l) = Liter (1,000 cm3)
MCM = Million Cubic Meter

Length

mm = Millimeters
cm = Centimeters (cm = 10 mm)
m = Meters (m = 100 cm)
km = Kilometers (km = 1,000 m)

Weight

gr = Grams
kg = Kilograms (1,000 gr.)
ton = Metric ton (1,000 kg)

Currency

Tsh = Tanzanian Shillings

Time

sec = Seconds
min = Minutes (60 sec.)
hr = Hours (60 min.)

Application of the Guidelines

1. What are described in the Guidelines?

The Guidelines focus on irrigation schemes development (gravity irrigation schemes, pump irrigation schemes for which the water source is a river, pond/lake, or water harvesting scheme) considering currently available budget for Irrigation Scheme Development (ISD) as well as current experience levels of the district staff. The Guidelines consist of four parts which are "Formulation Guidelines", "Implementation Guidelines", "Operation and Maintenance Guidelines" and "Training Guidelines". The Formulation Guidelines show a quick and practical way of formulating irrigation schemes in the ISD.

These Guidelines on the implementation stage describe how to proceed with each step of the implementation stage of irrigation scheme development (ISD).

The irrigation schemes formulated based on the Formulation Guidelines will be included in the ISD proposal through the procedure of ISD planning and approval within the district. After the ISD proposal is submitted to PO-RALG and the budget for ISD is approved and secured, the irrigation scheme development under ISD will proceed to the implementation stage to be promoted in accordance with the Implementation Guidelines, Operation & Maintenance Guidelines, and Training Guidelines respectively. More specifically, these Guidelines on the implementation stage describe a series of workflow including:

- Participatory action planning
- Registration of irrigators' organization (IO)
- Study and designing
- Tendering and contract awarding, including consulting services
- Construction work
- Operation and maintenance
- Capacity development for the community
- Monitoring and evaluation

In addition, these Guidelines help confirm necessary works and procedures in each step by means of flowcharts and checklists, and help proceed with each step of the implementation stage smoothly.

2. Why the Guidelines were prepared?

Preparation of DADP was launched in 2003 as one of the key activities presented in the Agricultural Sector Development Programme (ASDP) compiled in 2002. However, the ISD proposed by districts did not sufficiently present the appropriateness of their development plans, hence "Preparation of Guidelines for Irrigation Scheme Formulation for ISD" was selected as one of the priority supporting programmes in the National Irrigation Master Plan Study (NIMP) in 2002. In 2006, DADP Guidelines, superordinate guidelines to the Formulation Guidelines, were revised, and in accordance with its revision, the Formulation Guidelines were also revised through the applicability test conducted from March 2007 to June 2007.

This was coupled with a workshop and residential training sessions held from June 2007 to December 2007 on the actual operation of the revised Formulation Guidelines.

On the other hand, the guidelines which cover the implementation stage, including design, tendering and construction work, and O&M stage, operation, maintenance and farmers' organization, have been added.

The guidelines aim at:

- Defining necessary works and procedures to proceed smoothly with implementation, operation and maintenance after the ISD formulation and planning stage,
- Helping the Head Of Department dealing with Irrigation(HDI) and other district staff in charge of irrigation scheme development under the ISD to understand the activities to be practiced as government side persons, and
- Helping the Head of Department dealing with Irrigation and other district staff give community members and other stakeholders explanations and advice on necessary activities.

3. To whom the Guidelines were prepared?

The targets of these guidelines are the Head Of Department dealing with Irrigation, District Irrigation Engineer, Irrigation Technician, other district staff and farmers/community who are directly involved in formulation, implementation and O&M of irrigation scheme development. Zonal Irrigation Office/ Regional Irrigation Office (ZIO/RIO) staff are also a primary target of these guidelines because they are in charge of backstopping the districts, giving explanations and instructions on these guidelines to the district staff.

4. How the Guidelines were prepared?

A participatory approach was adopted for the preparation of these Guidelines. The Formulation Guidelines was revised through applicability tests activities in four model districts, the Guidelines were improved by District staff, ZIO/RIO staff and National Irrigation Commission (NIRC).These guidelines on the implementation stage, after being drafted, were improved, revised and finalized through discussions at workshops among district staff, ZIO/RIO staff and other stakeholders, and through the verification study in two model sites.

5. What is the special feature of the guidelines?

The most outstanding feature of these guidelines are: Quick, Systematic and Practical Irrigation Development Planning in ISD for the Formulation Guidelines, and Easy,_Practical and Sustainable for the implementation of Irrigation Scheme Development for other Guidelines respectively.

Background Information

(1) Authority

These Guidelines were the revision of the Guidelines for Irrigation Scheme Formulation for DAPD prepared as part of the Verification Study of the NIMP Study in the United Republic of Tanzania in December 2004.

The revision was made taking into account the results of the applicability tests conducted in four districts during the course of implementation of JICA-Technical Cooperation for Formulation and Training of the ISD Guidelines on Irrigation Scheme Development.

(2) Background and Objective

(a) Background

During the Action Plan Study, site inspection of many irrigation schemes with existing development plans in hand and discussion with district staff of ISD indicated that the development plans of irrigation schemes were not clear, especially from technical and economical viewpoints, and also there were no definite criteria for the selection of appropriate irrigation schemes from those included in Village Plans. To improve this situation, it was essential to prepare and apply some practical guidelines showing the proper steps of formulating schemes to be listed in ISD. The guidelines would, of course, need to be applied to have any effect, so there was a need to provide training in their use to the relevant district staff.

In this regard during formulation the reference should be made in NIMP 2018 for the following considerations; present condition of water, agriculture and irrigation sectors and the data available in the NIRC database as stipulated in masterplan. The Study emphasized that successful irrigation development depends upon good performance of all aspects of irrigation development, such as good planning, good design, good construction, and good O & M. In this sequence of events, the planning of irrigation schemes including selection of appropriate irrigation schemes is the most fundamental activity as a starting point toward successful implementation.

The strategic approach to the Short-term Programme (2003 to 2007) in the Development Programme for the Year 2017 is to reform the environment for the promotion of decentralization of irrigation development. The preparation of the guidelines and provision of related training to the district staff mentioned above duly coincide with this strategic approach.

(b) Objective

The objective of these Guidelines is to provide the district staff with a procedure for irrigation scheme formulation in the preparation of ISD Planning; the procedure consists of quick site inspection, screening, preliminary study, prioritization, evaluation and selection activities.

(3) Proposed Entire Process of Irrigation Scheme Development under ISD

In this section, the entire process of irrigation scheme development is explained in order to clarify the position and roles of the "Guidelines for Irrigation Scheme Formulation for ISD". The entire process is prepared in view of the Guidelines for District Agricultural Development Planning and Implementation, November 2006 the superordinate authorized guidelines to the Guidelines for Irrigation Scheme Formulation for ISD.

Taking into account the above, the process of irrigation scheme development under ISD is designed with the following basic concept:

- List-up of Irrigation Schemes on a "Demand Driven" basis Application of all irrigation schemes should be made by the village government taking into account the real demand of farmers. The Guidelines for ISD indicate the use of O & OD methodology as an effective method of participatory planning, which was endorsed by the Central Government. The Guidelines for Irrigation Scheme Formulation for ISD was prepared in consideration with this O & OD methodology.
- Development of Irrigation Schemes by District Government in a Participatory Process with Farmers. The irrigation scheme development should be carried out in a participatory manner with the involvement of farmers to implant awareness and ownership of the irrigation scheme in their minds. In connection with the participatory

approach, the NIC had prepared the Guidelines for Participatory Improvement to Farmers Initiated and Managed Smallholder Irrigation Schemes in July 2003 under ASPS. Thus, the Guidelines for ISD Formulation will be elaborated within this larger framework

(4) Compliance

All private sectors/person who persue Irrigation activities. No irrigation work should be constructed until the proposed scheme of the undertaking has been submitted to the Commission for approval and such project is subjected to the environmental impact assessment as provided for under the Environmental Management Act as per National Irrigation Act 2013, section 20(1)(2)(3)(4)(5) and it's Regulation 2015(29)

Terminology for the Guidelines

In these guidelines, the following terms are defined as shown below.

1. Team and Committee	
District Irrigation Development Team (DIDT)	One team formed in the district to facilitate the irrigation scheme development (ISD). The team will be composed of Head Of Department dealing with Irrigation as chairperson, District Irrigation Engineer, Irrigation Technician, Agriculture extension officer, Community development Officer and other relevant staff of the District Office. Participation of Ward leaders, Village leaders, representative farmers, and other stakeholders as determined by district council and NGO will be desirable.
Zonal Review Committee (ZRC)	A ZRC will be formed in each Zonal Irrigation Office/Regional Irrigation office (ZIO/RIO) to assess and endorse the proposed irrigation scheme development (ISD) formulation prepared by DIDT. The team will consist of the Zonal Irrigation Engineer as chairperson and experts in various fields such as irrigation, agriculture, soil science, and environment.
District Council	Council consisting of members of District Assembly.
District Council	Superintending Board for Tendering approved by the District Council.
Tender Evaluation Team	Special Team for Tender Evaluation on District based Tendering consisting of members nominated by the District Council Authority.
Irrigators' Organization (IO)	Association or cooperative society consisting of irrigators in the projected irrigation scheme.
Irrigators' legal entity	Irrigators' organization which has been registered as a legal entity – irrigators' association under National Irrigation Act (NIA).

2. Survey and Planning	
Quick Site Inspection	The site survey to be conducted for all the irrigation schemes in the district to choose high potential scheme(s) for preliminary planning.
Field Survey	The site survey to be conducted for irrigation schemes selected through screening.
Preliminary Planning	The planning for irrigation schemes selected through screening.
Participatory Action Planning (PAP)	The participatory action planning is intended to give an opportunity to all stakeholders of the project to interact to discuss and jointly make a plan of action for preparing the project.

Participatory Diagnostic Study (PDS)	The participatory diagnostic study aims at diagnosis of the opportunities available to the stakeholders as well as the constraints blocking the exploitation of these opportunities to understand current situations which the stakeholders can observe surrounding the scheme and the village.
Participatory Design	The participatory design aims at coming up with the solutions to the problems identified by the irrigators' as a result of the participatory diagnostic study, to confirm their technical feasibility.
Feasibility Study (FS)	The feasibility study forms an integral part of a project proposal, examining the financial, social and environmental feasibility of the project, to enable the ISD financiers to make an investment decision.
Detailed Design /Tender Documentation	The detailed design and the tender documentation aim at defining the detailed specifications of the proposed intervention to permit a final timeframe and cost estimates to be prepared to proceed to the subsequent tendering and procurement procedure.

3. Reports and Documents	
Quick Site Inspection and Screening	The report to be prepared by DIDT describing the results of screening. The report should be submitted to ZRC for assessment and endorsement.
Screening Endorsement Letter	The letter to be prepared by ZRC to endorse the results of screening conducted by district.
Confirmation Letter on the Proposed Area	The letter to be prepared by the village government to confirm that villagers agreed on the selection of the proposed area (area to be considered in the preliminary planning).
Irrigation Scheme Formulation Plan Report	The report to be prepared by DIDT containing all the results of the field survey, preliminary planning, and prioritization of the selected schemes along with the district supporting programme. All completed data forms and maps of the selected schemes should be attached to the report.
Validation and Agreement Letter	The letter prepared by ZRC to validate and agree on the results of the irrigation development planning conducted by the district.
Feasibility Study Report	The report to be prepared by the district, or ZIO/RIO or a private consultant
Detailed Design Report	The report to be prepared by the district, or ZIO/RIO or a private consultant
Tender Documents	The document/forms to be prepared by the district, or ZIO/RIO or a private consultant entrusted by the district.

4. Map	
Village Resource Map	The map prepared by villagers showing resources of the village, such as river, agricultural land etc.
Present situation Map	The map prepared by DIDT based on the village resource map. It shows also resources, but their exact locations (coordinates) are measured by handheld GPS then plotted on the graph paper.
Scheme Development Map	The map prepared by DIDT based on the present situation map. It shows village resources but also the locations of any proposed intakes, canals, roads, etc.

5. Area	
Potential Area	Total area which is technically feasible, economically and financially profitable, socially viable, and environmentally acceptable that is irrigated or capable of being irrigated on the bases of water availability, land availability, and suitability.
Cultivated Area	The area currently cultivated in the potential area.
Present Irrigated Area	The area currently irrigated in the cultivated area.
Present Rainfed Area	The area currently not irrigated in the cultivated area.
Proposed Area	The area to be considered in preliminary planning. The area should be selected by villagers as the first priority area in the field survey meeting, and a confirmation letter on the proposed area shall be sent to the district office by the village government.
Irrigable Area in Rainy Season	The area that can be irrigated in the wet season.
Irrigable Area in Dry Season	The area that can be irrigated in the dry season.
Development Area	The area to be developed (area to be provided irrigation and drainage facilities).
Command Area of the Main Canal	The area irrigated from the main canal. Normally, it is the same as the development area, except when the proposed development is an extension of an existing canal. For an extension scheme, the command area of the main canal consists of the existing area plus the development area (extension area).

6. Irrigation System	
Irrigation Scheme	Any irrigation system that meets one of the following is recognized as a single irrigation scheme: 1) The irrigation system has several canals conveying water from one intake. 2) The irrigation system has several intakes but the canals from the intakes are connected. 3) The irrigation system has several intakes with scattered canals but the intakes and canals are situated within one or more village.
Traditional Irrigation Scheme	Irrigation schemes that have been initiated and operated by farmers themselves, with no intervention from external agencies.  Traditional Irrigation Scheme
Improved Traditional Irrigation Schemes	Irrigation schemes that have been initiated and operated by Semi-subsistence farmers themselves and on which there has subsequently been some intervention by an external agency in the form of construction of a new diversion structure.
Modern Irrigation Schemes	Formally planned, designed and fully developed smallholder scheme in which full irrigation facilities have been provided by external agencies with or without some contribution from the beneficiaries, and in which there is usually a strong element of management provided by the government or other external agency.
Water Harvesting Schemes	Irrigation schemes that subsistence farmers have themselves introduced using simple techniques to artificially control the availability of water to crops. Includes flood recession irrigation schemes.

7. Type of Irrigation Scheme	
Gravity	An irrigation scheme in which water is supplied to agricultural land only with gravity force.
Pump (river)	The irrigation scheme for which the water source is a river and water is abstracted through pump.
Pump (lake/pond)	An irrigation scheme for which the water source is a lake/pond and water is abstracted through pump.
Rain water harvesting	An irrigation scheme that subsistence farmers have themselves introduced using simple techniques to artificially control the availability of water to crops. Includes flood recession irrigation schemes.
Groundwater	An irrigation scheme in which the water source is groundwater. Groundwater irrigation is not handled in the guidelines, since it needs special hydro-geological study. It is recommended that groundwater irrigation schemes be formulated in consultation with the ZIO/RIO.
Dam	An irrigation scheme in which a dam is the water source. Dam irrigation is not handled in the guidelines, since it requires special engineering studies. It is recommended that dam irrigation schemes be formulated in consultation with the ZIO/RIO.
Treadle pump	A treadle pump is a pump to lift water by pedal power. Treadle pump irrigation is not handled in the guidelines as it should be installed by farmers themselves, not the district government. However, promotion of treadle pumps can be emphasized and proposed in the ISD.

8. Required Works	
Rehabilitation	Works to recover the function of existing irrigation and drainage facilities up to the original level without changing irrigation system (not changing traditional or improved traditional system to a modern system).
Improvement	Works to enhance the function of existing irrigation and drainage facilities by changing the irrigation system (changing traditional or improved traditional system to modern system).
New Development	Works to develop a new irrigation and drainage system by providing new facilities (new irrigation and drainage facilities provision for a scheme where there are no existing facilities).
Extension	Works to extend the irrigation area from an existing upstream area to a non-developed downstream area.

Drainage	Works to improve the drainage condition of the scheme by providing new drainage facilities or improve existing drainage facilities without providing irrigation facilities (no irrigation works, only drainage works).

9. Interview Survey	
Household	A family unit managed under one financial control.
Anticipated negative impact	A bad influence that might occur because of a proposed irrigation development. Environmental problems not related to irrigation development (such as soil erosion under rainfed condition) are not "anticipated negative impact".
Water conflict within the scheme/village	Competition for limited water resources among villagers within the same scheme or village.
Water conflict between other schemes/village	Competition for limited water resources between different schemes or different villages.
Land conflict	Competition for limited land resources among villagers or between agriculturists and pastoralists.

10. Equipment	
Handheld Global Positioning System (GPS)	Equipment used to identify the geographical location of a point using satellite positioning. Horizontal measuring error of handheld type GPS is about 5-15 m, so while not suitable for measuring very small areas, handheld GPS is good enough for irrigation scheme formulation.

A Type of Handheld GPS

Handheld Electric Conductivity (EC) Meter	Equipment used to measure salinity, one of the major factors of water quality that must be checked. If salinity of the water is high, the EC meter shows a high value (high salt concentration).  A Type Handheld EC Meter

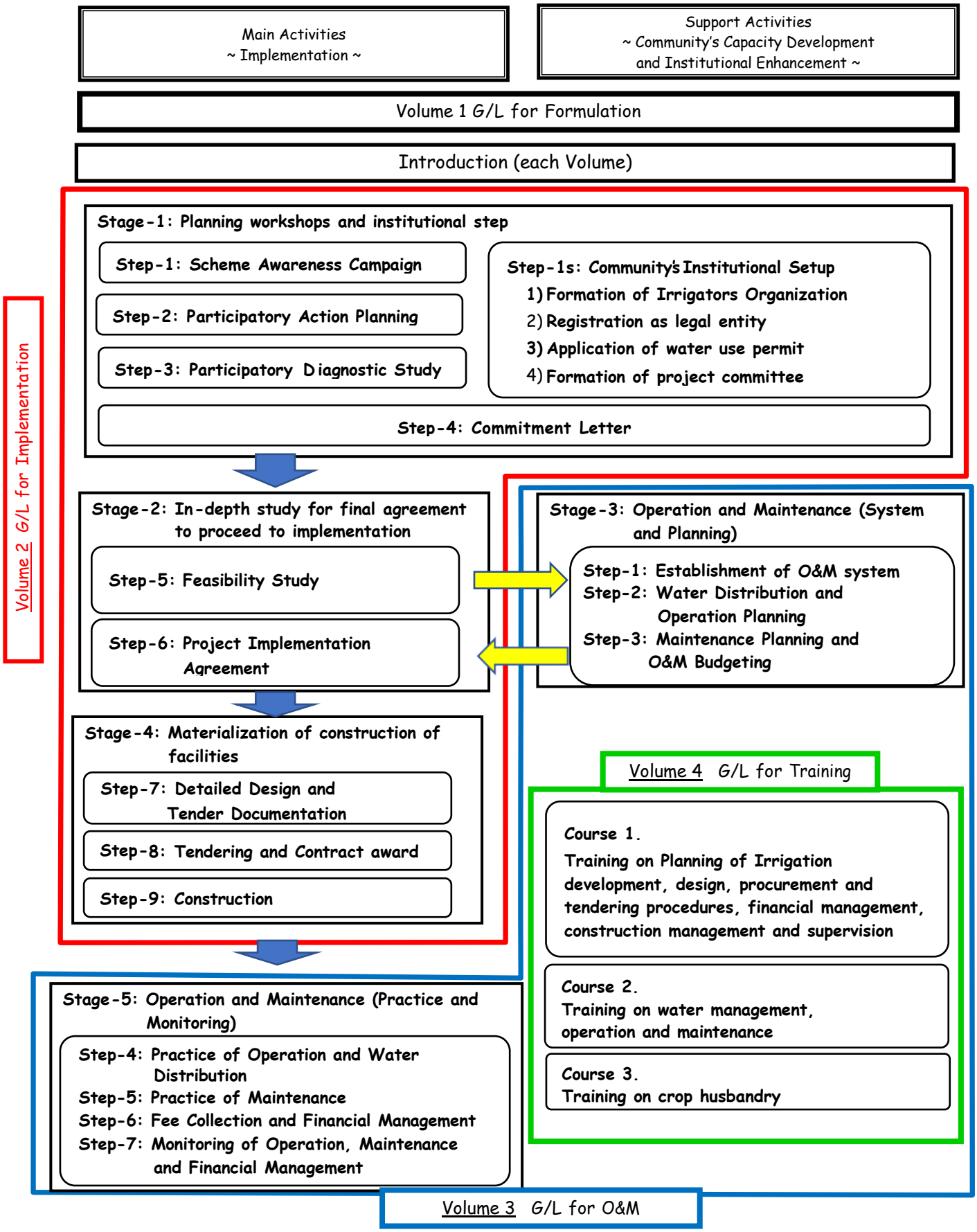
11. Database System	
National Irrigation Database	A database system that has been established in the National irrigation Commission (NIRC) for storing information about irrigation. It has four major functions: 1) Input data, 2) Output data, 3) Scheme maps an d 4) library. Data and information stored in the database can be provided to users of the guidelines upon request to the NIRC
Irrigation Geographic Information System (GIS)	A system established specifically for irrigation in the NIRC. It was prepared mainly using materials employed for the analysis of the potential Area for irrigation development. It consists of information on various types of general features (administration boundaries, rivers, and roads) along with more specific information such as agro-ecological zones, protected areas, land cover, land units and soil types. It can therefore be utilized for evaluating the irrigation potential of a proposed scheme. Data and information stored in the GIS can be provided to users of the guidelines upon request to the NIRC.

12.Recommended manuals	
Standard Design Manual for Canal	Objective of this manual is to support smooth enforcement of designing of irrigation canal by LGA supported by ZIO and NIRC using the flowchart for selecting the canal type and calculation charts for decision of canal cross-section, etc.
Construction Supervision Site Hand Book	The objective of the Site Handbook is to provide the staffs of Zonal Irrigation Offices (ZIOs) and LGAs with how to make construction management and supervision properly and effectively for the Project.
Rehabilitation Manual	Objective of this manual is to analyze problems of the irrigation facilities and propose planning, design and operation and maintenance methods in consideration of the present operation and management situation of facilities.

SECTION 2 STEPS

Outline of the steps – Step-1 to Step-9 and O&M

The main body of the guidelines is divided into four Volumes
– Formulation, Implementation, O&M and Training – as shown below:



Flow of the Implementation of Irrigation Scheme Development

Step	Outputs		
	Forms/Checklist	Reports/Letters/Map	What district & community achieve
Step-1Scheme awareness campaign	Form-1: Member list of DIDT Form-2: Memo on result of kick-off meeting		All stakeholders understand the project activities.
Step-1s Community's institutional setup			Legal standing for implementation and O&M is secured.
Step-2 Participatory action planning	Form-3: Action Plan		How each stakeholder contributes to each step is planned.
Step-3 Participatory diagnostic study	Form-4:Participatory diagnostic Study		Participants understand current situations, and baseline data for F/S are provided.
Step-4 Commitment Letter	Form-5: Form of Commitment letter	Commitment Letter	Irrigators' and district's obligations are confirmed.
Step-5 Feasibility study/Participatory design		Feasibility Study, Report, Community's Project Proposal	Final decision on whether to proceed to implementation is made.
O&M steps 1-3	Form-1 to 3: Basic O&M planning and budgeting Form-4 to 7: Recording and reporting formats Form 8 to 12: planning		O&M plan and budget
Step-6 Project Implementation Agreement	FORM 6 Project Implementation Agreement	Project Implementation Agreement	Confirmation of obligations of actors of PIA
Step-7 Detailed design and Tender documentation	Design Checklist	Tender documents	Detailed specifications of facilities and works are determined.

Step-8 Tendering and contract award	**Time frame of Tendering**	Invitation, Tender evaluation report, Contract award, Contract documents	Contractor for construction work is selected.
	Form 7a: Monitoring sheet for step 1-8	Monitoring sheet for step 1-8	For checking requirements of step 1-8
Step-9 Construction	Site handbook for construction supervision Manual, Monitoring sheet for Implementation Form 7b: Monitoring sheet for Step 9	Monitoring Sheet for Step 9	Construction work is carried out. For checking requirements of step 9

BOX 1

Implementation Guideline with explanation of Medium and Large scale project

Note that for all Consultants or other stakeholders implementing irrigation projects should adhere to comprehensive guidelines in some of implementation steps which is step 1,3,5 and 9.

Step 1 Awareness campaign

All stakeholders should understand the presence of Irrigators Organization (IO) that they are the one who will run the project after completion of the project therefore if they have any advice during implementation should be taken into consideration e.g sub step 4 shall be adhered

Step 3 Participatory diagnostic study

Consultants or any other institutions implementing irrigation project during problem identification or problem statement shall involve irrigators' organization/ farmers since they are more aware on the problem facing the scheme. During problem identification sub step 2 and 4 for participatory diagnostic study

Step 5 Feasibility study

During implementation step 5 which is feasibility study, Irrigators organization should be involved in basic O&M plan of the scheme, also shall utilize the environmental and social study manual and follow the outline of feasibility study report as stipulated in the comprehensive guide lines. See sub step 1 for feasibility study

Step 9 Construction

Consultants or any other institution implementing irrigation project during implementation step 9 shall utilize the site hand book for construction supervision as stipulated in the comprehensive guidelines. Especially at sub step 3 and sub step 4

Step-1: Scheme Awareness Campaign

Key Message

The DIDT explains to the community the steps of the project activities, the community's role, and the tentative schedule of the steps.

Why is the work required?

At the start of the implementation stage, the community shall be informed that the irrigation scheme was selected in ISD as the candidate which will proceed to the implementation Stage, and they shall be instructed how to proceed with the implementation.

Key for the success of the work

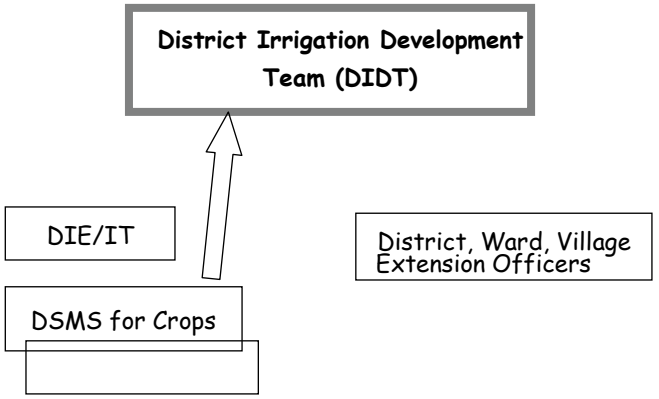
To help each category of stakeholders understand the steps of activities to be done from then onwards for the irrigation scheme development.

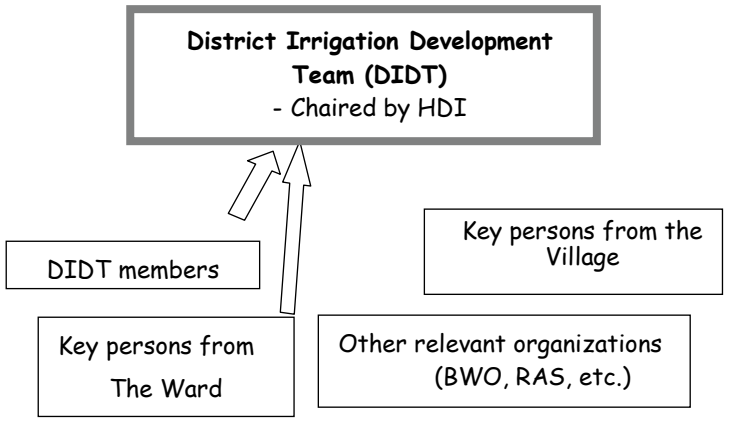
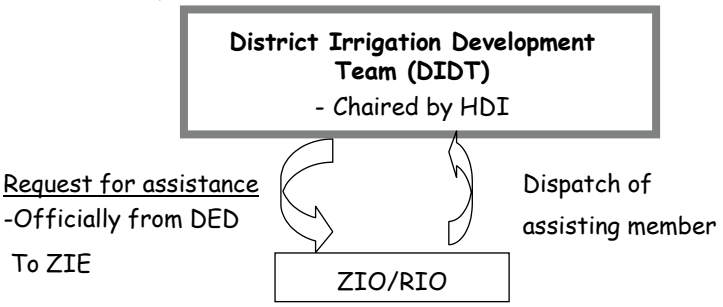
Required inputs

1. Facilitator: District Irrigation Development Team (DIDT), ZIO/RIO as assisting member of Community Development Officer (CDO) DIDT
2. Flip chart, marker pens, flip chart stand, masking tape, and other stationery
3. Member list of District Irrigation Development Team (DIDT), (**Form-1**)
4. Memo on the result of the kick-off meeting (**Form-2**)

How is the work carried out?

Sub-step 1 Organization of the District Irrigation Development Team (DIDT)	The District Irrigation Development Team (DIDT) will be organized at the start of the implementation stage to facilitate the project activities. The following matters shall be noted about the composition of the DIDT: 1) DIDT members will be involved in facilitating project activities.



	2) The persons who are not district staff members will be involved in DIDT to facilitate project activities.  3) A ZIO/RIO staff member can be an assisting member of DIDT upon request of the district to assist in project activities.  The DIDT will play a role in: a) Facilitation of participatory processes b) Implementation of the project c) Strengthening the community d) Provision of technical support during implementation, monitoring and evaluation of the project e) Carrying out of needs assessment for capacity building
Sub-step 2 Endorsement of the DIDT	The Head of Department dealing with Irrigation will prepare a proposed DIDT member list, using **Form-1**. The composition of DIDT members will be originally proposed by the Head of Department dealing with Irrigation, officially assigned by the DPLO on behalf of the DFT, and endorsed by the DED.
Sub-step 3 Arrangements for the Scheme Awareness Campaign – a kick-off meeting	The DIDT will make arrangements for the kick-off meeting, setting a convenient date and time. The participants of the kick-off meeting will be: • representatives of the ward and the village • target irrigators, i.e, those who have farmland in the proposed development area • potential irrigators, i.e, those who have farmland in the potential area • non-irrigators and livestock farmers, who might be

	positively or negatively affected by the irrigation scheme development • representatives of neighboring communities The representatives of neighboring communities shall be invited to participate only if it is felt that communities they represent are likely to be affected by the irrigation scheme development. However, the representatives of neighboring communities can be invited to the project activities regardless of the likelihood of their communities being affected by such development.
Sub-step 4 Preparation for the kick-off meeting	The DIDT shall prepare a presentation to explain the issues described in **NOTE 1** to the participants at the kick-off meeting.
Sub-step 5 Scheme Awareness Campaign – holding the kick-off meeting	The DIDT shall explain the following to the participants: • selection of the irrigation scheme • steps of the project activities • community's role in all the steps • tentative schedule of the steps See Technical Guidance (**Explanatory Note 1**.)
Sub-step 6 Preparation of memo on the workshop result	The DIDT shall prepare a memo on the results of the kick-off meeting, describing briefly the contents of discussion and the reaction of the participants, using **Form-2**, with the participants list and Minutes attached.
Result	
All stakeholders of the relevant irrigation scheme development will understand the contents of the project activities to be done.	

Step-1s: Community's Institutional Setup

Key Message

The community – will establish an institutional foundation for proceeding with project activities.

Why is the work required?

The project committee, elected from irrigators' organization, will be the main implementing body for the project activities at the scheme level. The project committee will play an active role under the supervision of the Irrigators Organization. Once the Full Council of the district approves the project and a decision is made to include the project in ISD action plan, the project committee shall be organized. The project committee will play a leading role in communication and arrangement with the DIDT and other stakeholders.

Also, the irrigators' organization will play a leading role in water management, operation and maintenance after construction of irrigation and other relevant facilities. At the start of the implementation stage, the irrigators' organization shall be registered as a legal entity, shall exchange a Commitment letter with the District Council, and shall prepare for acquisition of a water use permit.

See Technical Guidance (Explanatory Note 2 pg 4-6) and (Explanatory Note 3.)

Key for the success of the work

To make the community understand the roles of the project committee, the roles of the Irrigators' organization, and the necessity of water use permits.

Required inputs

1. Facilitator: District Irrigation Development Team (DIDT), and as required, ZIO/RIO as assisting member of DIDT
2. Project committee
3. Application form for registration as legal entity (= irrigation act / other act)
4. Application form for water use permit

How is the work carried out?

Sub-step 1 Formation of project committee	The DIDT will brief the roles of the project committee, to be elected from the irrigators' organization and instruct the irrigators' organization to make arrangements for the meeting to elect project committee members. The roles of the project committee shall be: a) Supervision of Project implementation b) Maintain a bank account under the supervision and the guidance of the District Executive Director c) Provide information on implementation progress to IO, VEO, HDI and Project Manager. d) Mobilize contributions from the IO members. e) Participate the procurement of goods and services under the technical assistance. f) Seek technical support and other services from extension workers, DIDT, ZIO/RIO, private consultants, NGOs and development agencies.

	g) Prepare and submit monthly, quarterly and annually physical and financial reports to the IO, VEO, PM and DED under technical support of DIDT. The project committee will be composed of not more than 10 members, and at least 40% of the members shall be women. The committee members will include chairperson, secretary, treasurer and signatories. The chairperson of the village government will chair the meeting for electing project committee members, and the village executive officer (VEO) will facilitate this meeting. Also, this meeting shall be attended by at least 70% of the IO members. After the project committee is organized, the Irrigator Organization will introduce PC to DED via Village Executive Officer. See example (a) and (b).
Sub-step 2 Understanding of Advantages / disadvantages of National Irrigation Act and other Act.	The type of the irrigators' organization is already planned at the formulation stage. At the start of the implementation stage, the type of the irrigators' organization shall be reviewed, and the decision on it shall be made. The DIDT, in collaboration with the project committee, will brief the community the advantages and the disadvantages of National Irrigation act and other act. Important issues to be briefed to the community/Irrigator Organization are: • An irrigators' organization – association or cooperative – shall be organized in order to operate and maintain the irrigation and other relevant facilities properly. • Compulsory participation of all irrigators is necessary. • The irrigators' organization shall be registered under the relevant National Irrigation Act at the start of the implementation stage. • Registration will enable rightful access to water use permit, land tenure and public services from the government. • Registration enables the legal entity to enter into contracts for works, training, credit, marketing, consultancy and other services. • The irrigators' commitment to full participation in project activities shall be confirmed in a letter of undertaking to the District Council. • Registering under the Association Act may have certain limitations to profit-making activities and provision of audit for accounts.

Sub-step 3 Decision on the structure of the legal entity	The DIDT, in collaboration with the project committee, shall instruct the community to make a decision on the form of the legal entity based on the above briefing.
Sub-step 4 Establishment of interim committee of or irrigators' organization	The DIDT, in collaboration with the project committee, shall instruct the community to elect interim committee members to the irrigators' organization.
Sub-step 5 Preparation of constitution /by-law	The DIDT, in collaboration with the project committee, shall instruct the community to prepare the constitution / by-law of the IO. The IO interim committee shall draft the constitution/ by-laws first, then the community shall discuss and decide on it at the general meeting.
Sub-step 6 Preparation of IO member list	The IO interim committee will prepare a signed member list of the IO.
Sub-step 7 Application for registration	The DIDT, in collaboration with the project committee, shall assist the committee of the irrigators' organization in obtaining the application form, filling it out, and submitting it for registration. After the irrigators' organization is registered, the committee shall ensure safe keeping of the certificate.
Sub-step 8 Election of Committee	After the IO is registered, the committee shall be elected according to the IO constitution.
Sub-step 9 Application for water use permit	The DIDT, in collaboration with the project committee, shall assist the committee of the irrigators' organization in obtaining the application form for water use permit, filling it out and submitting it to the relevant basin water office.
Result	
All stakeholders of the relevant irrigation scheme development will understand the contents of the project activities to be done from then onwards.	

Step-2: Participatory Action Planning (PAP)

Key Message

Involve all stakeholders in preparing a project proposal, defining required activities and confirming the stakeholders' commitment to any resources and time required.

Why is the work required?

For preparation of the proposed project, all stakeholders shall be given an opportunity to discuss and make a joint plan of action.

Key for the success of the work

To take into consideration the viewpoints of different types of participants – target irrigators, potential irrigators, non-irrigators, livestock farmers and representatives of neighboring communities.

Required inputs

1. Facilitator: District Irrigation Development Team (DIDT) and when required, ZIO/RIO as assisting member of DIDT, or private consultant or NGO to be procured as professional facilitator
2. Stakeholders inside/outside the community
3. Outputs of O&OD exercises
4. Outputs of the formulation activities – village resource map, scheme development plan map, and scheme formulation plan report
5. Flip chart, marker pens, flip chart stand, masking tape, and other stationery
6. Actions Plan (**Form-3**)

How is the work carried out?

Sub-step 1 Arranging for the first planning workshop	The DIDT will make arrangements for the first planning Workshop, setting a convenient date, time and venue to expected participants. The participants of the planning workshop will be: • ward and village leaders • project committee members • target irrigators (i.e. those who have farmland in the proposed development area) • target irrigators (i.e. those who have farmland in the potential area) • non-irrigators and livestock farmers, who might be positively or negatively affected by the irrigation scheme development • representatives of neighboring communities In addition, the representatives of neighboring communities shall be added to the participants in case the neighboring communities are likely to be affected by the irrigation scheme development, e.g. in case the irrigation scheme Development may cause water conflict with the neighboring communities. Community representatives may also be invited for reasons unrelated to the likelihood of conflicts

Sub-step 2 First planning workshop (1) - Review of outputs of O&OD and formulation activities	First of all, the facilitator will present the irrigation-related plan of intervention extracted from the outputs of O&OD exercises. See Technical Guidance- **(Explanatory Note 4)** and (**Explanatory Note 5**.) The irrigation-related extract from the outputs of O&OD will be a basis of the community's project proposal. However, the participants can modify the plan from the outputs of O&OD according to the discussion results at the workshop. Then, the facilitator will facilitate the discussion on the outputs of O&OD in the following manner. The facilitator shall lead the participants to reach an agreement on the discussion issues. See **Technical Guidance (Explanatory Note 4)** and (**Explanatory Note 5**.) 1) The participants will discuss and review irrigation-related extracts from the outputs of O&OD from the viewpoints of each category of participants including target irrigators, potential irrigators, non-irrigators, livestock farmers and representatives of neighbouring communities. The discussion will focus on: • any other opportunities, obstacles and causes to be added to the list • any opportunities, obstacles and causes to be omitted from the list 2) The participants will review, and modify as appropriate, the interventions, steps of implementation, inputs and the costs in accordance with the modified opportunities, obstacles and causes. In this review, the participants will refer to the following information: • Outputs of formulation activities - Scheme development and formulation plan from the forms and the report of formulation - Village resource map - Scheme formulation plan map • Three year community development plan from the outputs of O&OD • Tentative schedule of the project activities explained at the kick-off meeting

Sub-step 3 First planning workshop (2) - Discussion on plan of actions	The facilitator will facilitate the discussion among the participants on plan of actions, using **Form-3**. The action plan includes the following: • Responsibilities of each category of stakeholders for each step • Time frame, cost and funding source for each step • necessary technical support for each step The DIDT will receive a copy of the action plan – Form-3 – from the community/Irrigators organization.
Result	
The plan of actions – steps of implementation as well as responsibilities, time frame, funding source and necessary technical support for each step will be clarified.	

Step-3: Participatory Diagnostic Study (PDS)

Key Message

The participants will understand what they should think of to make the intervention successful, and what kind of study is necessary in the subsequent feasibility study (Step-5) through the diagnostic study.

Why is the work required?

This work is needed to enhance the prospects for the proposed subproject being market-driven and responsive to real opportunities and constraints, and for the participants to understand the current situations surrounding the irrigation scheme and the village. It helps provide baseline data for the subsequent feasibility study.

Key for the success of the work

To take into consideration the viewpoints of different types of participants – target irrigators, potential irrigators, non-irrigators, livestock farmers and representatives of neighboring communities.

Required inputs

1. Facilitator: District Irrigation Development Team (DIDT) and as required, DIDT, ZIO/RIO as assisting member of DIDT, or private consultant or NGO to be procured as professional facilitator
2. Stakeholders inside/outside the community
3. Flip chart, marker pens, flip chart stand, masking tape and other stationery
4. Participatory Diagnostic Study (**Form-4**)

How is the work carried out?

Sub-step 1 Arranging for the second planning workshop	The DIDT will make arrangements for the second planning workshop, setting a convenient date, venue and time to expected participants. The participants of the planning workshop will be: • ward and village representatives • project committee members • target irrigators (i.e those who have farmland in the proposed development area) • potential irrigators (i.e those who have farmland in the potential area) • non-irrigators and livestock farmers, who might be positively or negatively affected by the irrigation scheme development • representatives of neighboring communities In addition, the representatives of neighboring communities shall be added to the participants in case the neighboring communities may be affected by the irrigation scheme

	Development, e.g. in case the irrigation scheme development may cause water conflict with the neighboring communities. Community representatives may also be invited for reasons unrelated to the likelihood of conflicts.
Sub-step 2 Second planning workshop (1)	The facilitator will facilitate the discussion among the participants by using Form- 4.
Sub-step 3 Second planning workshop (2) – Identification of measures, solutions and strategies	The facilitator will facilitate the discussion among the participants on identification of measures, solutions and strategies, using **Form-5**. See Technical Guidance- **(Explanatory Note 6**)
Result	
The participants will understand the current situations surrounding the irrigation scheme and the village. Also, baseline data will be provided for the subsequent feasibility study.	

Step-4: Commitment Letter

Key Message

The commitment of the legal entity – irrigators' organization – is confirmed through the Commitment Letter.

Why is the work required?

Commercialization demands that irrigators be organized under a legal entity that is empowered to organize and manage the project and to conduct business. The Letter of undertaking is required to make commitments between the scheme and the District Council.

Key for the success of the work

To make the legal entity understand the contents of commitment and obligations.

Required inputs

1. Facilitator: District Irrigation Development Team (DIDT) in collaboration with the project committee, and as required, ZIO/RIO as assisting member of DIDT, or private consultant or NGO to be procured as professional facilitator.
2. Committee members of the irrigators' organization
3. Form of Commitment Letter (**Form-5**) should be written in Kiswahili.
4. Minutes of meeting concerning farmers contribution

How is the work carried out?

Sub-step 1 Writing "Commitment Letter" to District Council	The facilitator shall explain the contents of the commitment and the obligations to be confirmed by the Commitment Letter to the committee members of the irrigators' organization (IO). See Technical Guidance **(Explanatory Note 7**.) The facilitator shall instruct the committee members of IO to write the Commitment Letter, using **Form-5**, and to sign the letter. The DIDT shall fill and submit Form 7a to ZIO after completion of step 1-4.

Result

The legally established entity representing the participating irrigators will confirm their commitments and obligations.

Step-5: Feasibility Study (FS)

Key Message

The irrigators' organization should participate in conducting a study or investigation to analyze the feasibility of the ISD. This study should be carried out by a committee-driven management in cooperation with DIDT and ZIO/RIO. In regard to bbhe FS, the committee should also get involved in the FS by applying 'Participatory Design Approach' in order to reflect their indigenous knowledge and skills for the scheme.

Why is the work required?

Participatory FS is needed to promote ownership and commitment, and to provide basis for the feasibility study, which in turn will provide basis for acceptable designs which in turn will provide basis for decision. Besides, it is needed to screen for any harmful environmental impacts.

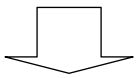
Key for the success of the work

For the purpose of realization of the irrigation scheme expectations, the committee should be involved in the FS by applying 'Participatory Design Manner'. However, the committee should practice a reliable optimum plan (e.g. O & M plan) mentioned in the FS report, which should be presented to the committee after completion of the study.

Required inputs

1. District Irrigation Development Team (DIDT)
2. Zonal Irrigation Office/ Regional Irrigation Office (ZIO/RIO)
3. Irrigators' Organization / Project Committee
4. Private Sector (e.g. Consultant)

How is the work carried out?

Sub-step 0 What is Feasibility Study (FS) ?	Feasibility Study (FS) provides the means for assessing developmental options for investment in the current conditions of irrigation.  Study/Investigation/ Review/Assessment The feasibility study is expected to provide options for the client with recommendations for the best option combining technical feasibility, financial and economic viability, social desirability and environmental sustainability. Detailed explanation on FS is shown in **Box 1 and General Information (Appendix 5-1**.) The flow of FS is shown in **Technical Guidance (Explanatory Note 8**.)
Sub-step 1 Preparation of Feasibility Study (FS)	1. Selection of TOR Referring to the result of Step 3 (PDS), at the beginning, DFT and the District should prepare TOR as required in the Feasibility Study in cooperation with the ZIO/RIO or NIRC. The envisioned specific study items of TOR to be carried out in FS are shown in Technical Guidance **(Explanatory Note 10**.) Based on the envisioned TOR, the TOR of FS for the proposed ISD project will be designed as per FS type. The TOR on ISD project will be sorted out based on the following categories;

	- TOR on the work to be done District/Community's own self - TOR on the work to be delegated to ZIO/RIO - TOR on the work to be delegated to other private sectors (e.g. consultant, NGO if need arises) 2. Selection of Pattern of FS Implementation The types of FS implementation are also categorized into the following types depending on the constitution member who shall conduct the FS see Technical Guidance **(Explanatory Note 11**). FS pattern depends on constituent member Case 1: District Staff + ZIO/RIO + Irrigators' Organization (In case of small scale scheme and simplified TOR) Case 2: District Staff + ZIO/RIO/NIRC + Irrigators' Organization (In case of medium scale scheme, excluding special TOR item such as required specialists of private sector) Case 3; District Staff + ZIO/RIO/NIRC + Private Sector (e.g. Consultant Irrigators' Organization (In case of large scale and including many TOR items such as required specialist from the private sector) Of course, the Irrigator' Organization member should participate in these FS as a direct stakeholder in each case applying the 'Participatory Design Approach'. Regarding 'Participatory Design', refer to **Box 2** and Sub-step 4. 3. Cost estimation of the works for each TOR DIDT should also prepare a cost estimation for each TOR in cooperation with ZIO/RIO. After estimation of those costs, the DIDT should secure the budget from District council to carry out each TOR smoothly. Samples of TORs and cost estimates for the implementation of FS are shown in General Information **(Appendix 5-2.)**
Sub-step 2 Preparation and Signing of Agreement with selected party (e.g. ZIO/RIO or others)	Engineering works such as designs and cost estimates in the FS should be carried out jointly between the Irrigators' Organization (or their representatives) and the technical assistants (e.g. design engineers of ZIO/RIO or other specialists) who may have been appointed by the district council in collaboration with ZIO/RIO. Then, in case the district council delegated the FS works to ZIO/RIO, the council should make an agreement with ZIO/RIO using a contract form. ZIO/RIO will conduct the works based on TOR after signing of the agreement with the district council. The Project Committee of the IO should also sign as witness to the agreement. Regarding 'Agreement Form (Draft)', see General Information **(Appendix 5-3**.)

	Sub-step 3 Procurement of Consultants (if need arises)	As mentioned in sub-step 1 above, if need arises for specialists, consultant(s) will be obtained through the district council or ZIO/RIO. Main reason is that ZIO/RIO as a substitute for the committee can satisfactorily supervise the works specified in the TOR to be carried out by a consultant. The procedure for obtaining consultants is shown below 2. Selection system of proper consultant The proper consultant will be selected using the system described above. The contents of the proposal system submitted by consultants are shown in Technical Guidance- (**Explanatory Note 13**.) 3. Contract with consultant The contract awarded based on the evaluation of the submitted proposal will be made signed as a contract between the DED/NIRC and the consultant. And the HDI, and ZIO/RIO should sign as witnesses. And the HDI, and ZIO/RIO should sign as witnesses in case of contact is signed between Consultant and DED. The Contract Form should also be based on the said 'Local/Central Government Reaulation'.
	Sub-step 4 FS Implementation and Approach by applying Participatory Design Approach by the Irrigators' Organization (IO)	1. Implementation of FS Preparation of the FS implementation will be officiated by the party concerned. The flow of FS is confirmed again in Technical Guidance **(Explanatory Note 8).** 2. Participation in FS by the Irrigators' Organization (IO) The approach should involve the Irrigators' Organization in identifying the options jointly with the engineer/specialist and making informed choices between them on the basis of cost-effectiveness by applying 'Participatory Design Manner' (see Box 2).

1. How to carry out the procurement of consultants
If the District has to procure consultant(s), the procedure should be followed in a proper sequence by applying the PPRA. The procedure for procurement of a consultant is shown in Technical Guidance **(Explanatory Note 12**.)

Sub-step 5 Major Requirements (to be studied in-depth in FS)	• Project cost estimation Cost estimation based on Plan of Project and Implementation Plan • Project evaluation Implementation of Economic and Financial analysis. • Environmental Impact Assessment (EIA) Implementation of EIA using THE ENVIRONMENTAL IMPACT ASSESSMENT AND AUDIT REGULATION, 2005. As it now stands, the EIA shall be conducted for any irrigation development projects at the Feasibility Study stage. Regarding this EIA consideration including the Forms, see
Sub-step 6 Presentation of Feasibility Study Report	After completion of the FS, the consultant(s) of this study should Submit the FS report in accordance with the contract(s). The FS report should be endorsed by irrigators/DED and approved by NIRC; and it should include the following topics: - critical analysis and solutions; - description of the preferred solution; - environmental scoping - timeframe for implementation; - proposals for management; - proposals for O&M; - proposals for M&E; - proposed irrigators' contribution. Regarding 'Presentation of FS report', see Technical Guidance **(**Explanatory **Note 14**.)
Sub-step 7 Endorsement of FS report by irrigators' organization	At the end of this step, the irrigators should give their endorsement for the FS report and approved by NIRC. The DIDT shall fill and submit Form 7a to ZIO after completion of step 5.
Results	
- TOR of Feasibility Study - Agreement between District Council and ZIO/RIO or any others - Contract between District Council (or ZIO/RIO) and Consultant(s) - EIA registration Form - Feasibility Study Report	

Box 1

What is feasibility study (FS)

Feasibility Study (FS) provides the means for assessing developmental options for investment in irrigation. A feasibility study for irrigation development would assess the physical aspects of land, water and climate, and evaluate crop production potential and cropping programmes within the context of the physical aspects. The same study reviews and assesses alternative engineering options in terms of benefits and costs, operation and maintenance, compatibility with the available land and water resources, their impact on the environment, the health of the users and social life and welfare of the irrigators. Finally, market potentials and access to markets are critically reviewed through such studies and the financial and economic aspects of the development are evaluated. In summary, the feasibility study is expected to provide options for the client with recommendations for the best option combining technical feasibility, financial and economical viability and social desirability and environmental sustainability.

(Source: Chapter 6, Module 1, Irrigation Manual Vol.I / FAO, 2002)

For reference see Appendix 5-1 and an Activities Study in FS Level in Technical Guidance **(**Explanatory **Note 9)**

Box 2

Preparation of Operation and Maintenance Activities

After completion of conducting step 1-5 of implementation, one should starts the preparation of O&M activities by conducting Step 1 – 3, Refer to CGL Volume-3 (Operation and Maintenance Guideline).Then conduct step 6-8 of implementation.

Step-6: Project Implementation Agreement (PIA)

Key Message

As premises for the Project Implementation Agreement, the project committee should obtain an appraisal from head of Department dealing with Irrigation and an approval from the district council concerning the results of FS. Besides, the Project Implementation Agreement would also specify the terms and conditions to be kept by the project committee. The project committee should fully understand the contents to continue and develop the project.

Why is the work required?

It is required so that the finance for the project, as defined by the Feasibility Report, can be allocated.

Key for the success of the work

As the project requires a large amount of funding, the project committee should explain the district's Contribution in the project and seek acceptance of the Project Implementation Agreement to the IO. The project committee should fully understand the terms and conditions in the agreement, such as irrigators' contribution in the Project Implementation Agreement.

Required inputs

1. Zone Irrigation Engineer (ZIE)
2. District Irrigation Development Team (DIDT)
3. District Executive Director
4. Project Committee
5. Irrigators Organization (IO)

NOTE:
The number of actors of the PIA may depend on the nature of the project also the contents of the PIA may depend upon source of fund.

How is the work carried out?

Sub-step 1 Explanation of FS including EIA results to the Head of Department dealing with Irrigation	The project committee should explain the FS results of the recommended irrigation scheme to the Head of Department dealing with Irrigation. The project committee should also explain the EIA result such as 'No problem for the involved environment of the project' or 'to take measures to preserve the environment of the project' to them. In regard to the explanations to the Head of Department dealing with Irrigation, the Project committee should obtain an adjudication of appraisal for the FS including EIA from the Head of Department dealing with Irrigation. If its response is 'OK' or 'No Problem', the committee can proceed with it to next sub-step. However, if the reply is 'NO' or 'Problem', the FS should be cancelled or reconsidered. Flow of this step is shown in **Technical Guidance (Explanatory Note 15 and Note 16.)**

Sub-step 2 Explanation of FS including EIA results to the district council	The Head of Department dealing with Irrigation should explain the FS results including EIA to the district council. After an adjudication of approval for the FS including EIA from the district council. If its response is 'OK' or 'No Problem', the project committee can proceed to next sub-step. Howe the reply is 'No' or 'Problem', the FS should be cancelled or reconsidered. In the case of positive responses obtained from both the Head of Department dealing with Irrigation and the district council, the project committee can proceed with the FS to next sub-step.
Sub-step 3 Preparation of Project Implementation Agreements	The Project Implementation Agreement will be prepared for signing between the project committee, DED and ZIE. The agreement should also specify the financing and implementation plan. In this plan, the nature, timing and estimated cost of the irrigators' contribution, as well as their subsequent responsibilities for operation, maintenance, monitoring and evaluation should be clearly indicated about. It will also clearly specify the irrigators' right on Approval/veto for any disbursements relevant to the project. Therefore, members of the project committee should understand and preserve the financial plan in the
Sub-step 4 Signing of Project Implementation Agreement.	The Project Implementation Agreement should be formalized. It shall be signed by representatives of the District Executive director, Zonal Irrigation Engineer and the project committee. Agreement forms should be in both English and Kiswahili. Sample of the Agreement is shown in **FORMS** (**FORM 6**) As a reference, the diagram of the ISD fund from ASDP to the district level is shown in **Technical Guidance (**Explanatory **Note 17**.)
Result	
Signed agreement specifying the financing plan and implementation rules including irrigators' right on Approval/veto between the District Council and the Project Committee.	

Step-7: Detailed Design (DD) and Tender Documentation

Key Message

Both the Detailed Design report and the Tender Document will be prepared based on the FS report. The updated cost estimation document is prepared based on detailed facility plan in DD and cost update work by applying current cost/rate (e.g. unit cost of labor, material and machine). The Tender Document will be prepared like other standard tendering documents. The irrigators' contribution should also be clearly specified in the Tender Document. For ... document will be prepared to conduct tendering for purposes of implementation in the next step. The composition of the tender document is shown in (**Technical Guidance- Explanatory Note 21** and **General Information-Appendix 7-1**.)

Why is the work required?

It is required to prepare tender documents for the civil works to be applied/constructed.

Key for the success of the work

DD report and Tender Document will be prepared by the District, ZIO/RIO or a consulting firm. They will also be responsible for the next stage of tendering and supervision works. It is necessary to select a competent one in order to progress with the project smoothly.

Required inputs

1. District Irrigation Development Team (DIDT)
2. Zonal Irrigation Office/Regional Irrigation Office (ZIO/RIO)
3. Consultants
4. Standard Design Manual for Canal

How is the work carried out?

Sub-step 1 Preparation of Detailed Designs, Tender Documents & Updated Cost Estimation documents	The following three reports and documents will be prepared in this step. The flow of the work is shown in (**Technical Guidance- Explanatory Note 18.**) The characteristics of each report or document are mentioned below. 1. DetailedDesignReport Preparation of the Detailed Design report based on Facility Plan of the FS report. Regarding to the contents of the DD report, see (**Technical Guidance- Explanatory Notes 19 and 20**.) The DD report will be prepared in English, with a Kiswahili translation of the executive summary. The irrigators' contribution should also be mentioned clearly in the drawings and tender document (see in **General Information- Appendix 7-1**) 2. UpdatedCostEstimationDocument This document is produced as an updated detailed cost estimation reflecting the result of the Detailed Design based on the Project Cost Estimation of the FS report. In cases where the estimated cost in the DD would be significantly higher than that considered in the FS report (upon which the decision to proceed the detailed project design was taken), the financial analysis should be repeated to confirm that the investment remains viable. Assuming that this is so, approvals/acceptances/endorsements should be sought to the additional cost should be obtained from the irrigators' organization and donor before proceeding further. At the tendering stage this updated estimation cost is called 'Engineer's estimate'.
Sub-step 2 Procurement of consultants	In the event that the detailed design and tender documentation are prepared by a private sector consultant (usually a consulting engineering firm in the case of interventions involving construction of physical works), the district should procure a proper consultant by applying public procurement regulations similar to the selection of consultants at the FS stage. However, if the nature and scale of the intervention is not so difficult, the district staff could prepare the design by themselves, and the consultant is not required for the job. The brief procedure to procure consultants is shown below. A detailed explanation is provided in (**Technical Guidance- Explanatory Note 22**.) Preparation of TOR Invitation using public participation by applying proposal method or Restricted tender method (Short listing method) Receipt and evaluation of submitted proposals Decision
Sub-step 3 Receipt and Approval of the above three Documents by the District Council	When the three reports and documents mentioned in Sub-step 1 are submitted to the District, the District Council should accord the approval/acceptance to those report and documents. The reports and documents shall be subject for endorsement by ZIO/RIO before approval.
Sub-step 4 Consent of Irrigators' Organization	All the 'no objection' or approval for the additional subject should be obtained from the irrigators' organization to the next step.

Result

Approved Detailed design report and tender documents, together with updated cost estimate.

Step-8: Tendering and Contract Award

Key Message **The Public Procurement Regulations shall be applied in tendering and awarding contracts.**

Why is the work required?	
To permit competitive bids to be received and evaluated.	
Key for the success of the work	
Selection of tendering option, a proper procedure of tendering and decision of a suitable contractor are essential to success of tendering and awarding contracts. In order to carry out these works, it will usually be necessary to obtain cooperation from the consultant in order to conduct the process of tendering smoothly.	
Required inputs	
1. District Council 2. District Council Tender Board 3. Tender Evaluation Team appointed by the Board 4. Consultant 5. Contractor 6. ZIO	
How is the work carried out?	
Sub-step 1 Understanding and Cooperation by Consultant	Work flow for this step is shown in (**Technical Guidance-Explanatory Note 23**.) Main works are Tendering and Contract Award. The District is responsible for organization of these works. However, these works would usually be carried out in cooperation with the consultant who carried out the DD and preparation of tender documents. This is because the consultant is more familiar with the contents of the construction, and in most cases the consultant continues the consultancy work of 'Construction Supervision' in the next step.

Sub-step 2 Selection of Tendering Option	In tendering, various types of options are sorted out. These options are set out in the following Regulations. - Public procurement (Procurement of Goods and Works) Regulations - Public procurement (Procurement of Consultants) Regulations As the bidding options, the following types are available. • Prequalification (in preparation for restricted bidding) • International Competitive Bidding (ICB) • National Competitive Bidding (NCB) • Restricting Bidding (the Max. limit is set at Tsh800Mill.) • Single Source Procurement for Consultancy Services and Goods • Direct Contracting for Work Considering the budget amount of the ISD project, the most appropriate bidding method to be applied shall be the 'National Competitive Bidding (NCB)' since the ISD project amount is not large.
Sub-step 3 Preparation of Tender	Tendering process is sorted out in the following five steps. Tender Announcement ↓ Prequalification and evaluation (Does not apply in ISD projects ↓ Distribution of Tender Documents to Interested Tenderers ↓ Bid Opening and Evaluation ↓ Selection of Awarded Contractor In the bidding of ISD irrigation scheme, the procedure of prequalification and its evaluation do not apply because the ISD project amount is not large. The relationship between 'contents of each process' and 'party in charge of every process' are shown in (**Technical Guidance- Explanatory Note 24**.) Explanations of the main processes are as mentioned below.

Sub-step 4 Tender Announcement	During tender announcement, the tender client will place the 'Invitation for Bids (IFB)' on a newspaper published nationwide and post the notice on a public bulletin board at the District Office. These tender procedures will be conducted by the District Tender Board. And the IFB will be issued by the secretary of the District Tender Board. The following entries are usually mentioned in the IFB. - Name and site of the irrigation project - Nature of the works including the project - Place where Tender Documents are distributed - Deadline for submission of bids - Date and place of bids' opening - Other necessary information Samples of IFB are shown in **General Information (Appendix 8-1.)**

Sub-step 5 Distribution of the Tender Documents	The District Tender Board will distribute the Tender Documents to the interested eligible tenderers. The Distribution of Tender Documents and handling the Question & Answer session on the Tender Document will be done in association with consultant if necessary. Forms of Tender Documents will be prepared based on the guideline of the Standard Tendering Document (Procurement of Works) issued by National Competitive Tendering (Smaller Works Contracts). The Tendering Document will consist of the following provisions; 1) Estimates of the cost required for scheme development, if there is a recommendable scheme. 2) Estimates of the cost of the district supporting programme, if any. 3) Calculations of the total cost of irrigation development under this ISD. In case of ISD project, the bidding time is often set out as one month. A Tender Document as a sample is attached in **(General Information - Appendix 8-2.)**
Sub-step 6 Receiving Bid Document and Bid Opening	Eligible bid documents from the contractor should be submitted by the deadline mentioned in 'Instruction of Tender' with a series of necessary documents. After closing the receipt of bid documents, Bid Opening will be launched by the District Council Tender Board in the audience (STF, district staff, contractor, stakeholder, etc.). Bid Opening can result in low bids being rejected for subjective reasons, such as creating risk of undesirable practices and sometimes selecting an incompetent contractor.

Sub-step 7 Tender evaluation and Approval by the District Tender Board and The project committee	Then the Tender Evaluation Team of the District or Consultant supported with the District will draw up the Tender Evaluation report in English accompanied with a Kiswahili translation to facilitate participation by the Irrigators' Organization in this process. The Tender Evaluation Team or Consultant shall apply the Tender Evaluation Guideline (Procurement of Works or Goods) published by public Procurement Regulatory Authority (PPRA) (2015) in evaluating bidding and the tender document. The Tender Evaluation report will be submitted to District Tender Board and Irrigators' Organization to get approval for the awarded tenderer. A Tender Evaluation report as a sample is attached in **(General Information - Appendix 8-3.)** For the contents of a suitable bid evaluation report, PPRA or the World Bank website can be referred.
Sub-step 8 Award of Contract	After tender evaluation and approval, the successful tenderer can enter into contract with the District Council, and can proceed to the next construction stage as the Contractor.
Result	
Bid Document submitted by Contractor Tender Evaluation report prepared by the Tender Evaluation Team of the District or Consultant Award of contract(s) for project implementation, approved by the project committee. Dully-filled form 7a (Monitoring Sheet for steps 1-8) should be submitted to ZIO/RIO	

Step-9: Construction

Key Message
Construction is the visible result of this Implementation Stage. For this stage to succeed various stakeholders should cooperate. The desired outcome of the construction will be carried forward to provide a favorable situation in the Operation and Management stage.

Why is the work required?

Construction is the key activity in the achievement of project objectives.

Key for the success of the work

Joint effort of various actors involved, including/ especially the irrigator's entity. Desired outcome will be also lead to a good situation to promote Operation and Management stage.

Required inputs

1. District Council
2. Zonal Irrigation Office/ Regional Irrigation Office (ZIO/RIO)
3. Consultant
4. Contractor
5. The project committee/Irrigators' Organization

How is the work carried out?

Sub-step 1 Issue of the Letter of Acceptance to Commence the Works from the District	The District which is the owner of the construction contract signed in Step 7 should issue a letter of acceptance 'to Commence the Works' (see Appendix 9-1) to the contractor within a specified period in the contract document. The Work flow of this step is shown in (**Technical Guidance - Explanatory Note 25**.)
Sub-step 2 Submission of Construction Work Plan and other necessary documents	The contractor should submit his necessary documents (Construction Work Plan, Application form to be submitted, etc.) at the start of the construction. The gist of Construction Work Plan is shown in **(General Information - Appendix 9-2)**
Sub-step 3 Supply of goods & services by contractors	After the contractor submit the documents above mentioned in sub-step 2, the contractor shall start the actual preparatory work at the initial stage; - Preparation work (Site condition, Topo-survey, Stock yard, etc.) - Supply of goods (Cement, Wood, Truck, Carpenter, etc.) Then full-scale construction work will be carried out in accordance with the Work Plan. Sample of Construction Schedule is shown in **Technical Guidance (Explanatory Note 26**.) A portion of the Irrigators' Contribution of not less than 20% of the cost in cash or in kind are procured or confirmed in this process, respectively. Regarding this Irrigators' Contribution, the points to keep in mind are written up in **Technical Guidance (Explanatory Note 27**.)

Sub-step 4	Construction by contractors & supervision by consultant (if necessary)	If the consultant is contracted as a construction supervisor by the District Council, the consultant will start the work of construction supervision on behalf of the District. The works of the consultant are mentioned below. - Supervision of Work Schedule see **Technical Guidance (**Explanatory Note26) - Supervision of Work Quality see **General Information (Appendix 9-3)** - Supervision of Work Safety see **General Information (Appendix 9-4)** - Reporting to the Owner and other related organization
Sub-step 5	Final inspection of the Construction work and Issue of Certification Letter of the Project	After the contractor completes the construction work and submits the letter of request on Final Inspection, the consultant should carry out the final inspection instead of the owner. If the consultant points out some failed or work to be repaired in the construction works, the Consultant shall order the contractor to repair the works. After all restoration works are completed by the contractor without problems, the consultant should submit 'the Certificate of Completion' to the contractor as the certification of the completion of the construction. The contractor should also submit as built drawing. The contractor can claim the final payment to the owner based on the Certificate of Completion on the completion of the construction. As a result of the issued certification letter, 'Defect liability period' will be commenced based on the contract. Finally, the completed woks will be transferred officially to the owner.
Sub-step 6	Handing over of Irrigation Facilities to IO	Project manager will inform the client and beneficiaries about completion of the project and informing them the proposed date for joint inspection and handing over meeting Then Project manager will organize a meeting on the proposed date. Inspection of facilities will be conducted and followed by handing over ceremony of the project to Irrigators Organisation (IO) for utilization and preparation of Operation and Maintenance stage. Handing Over Certificate will be given out **(See sample of the certificate on Appendix 9-5)**
Sub-step 7	Preparation of Operation & Maintenance	The handing over of the project will mark the end of the implementation stage and the beginning of preparations for the Operation & Maintenance stage by the Irrigators' Organization.

Result
Letter of Acceptance to commence the construction Construction Work Plan Certificate of Completion of the Contracted Construction As built document submitted by the contractor Agreement between both parties on defect liability period of the completed construction works. Dully-filled form 7b (Monitoring Sheet for step 9) should be filled by Project Manager and submitted to ZIO

SECTION 3 FORMS

Form-1 Member list of District Irrigation Development Team (DIDT)

Date:…….

……District Council will assign the members of the District Irrigation Development Team (DIDT), as shown below, for supporting community-initiated irrigation activities in the district:

The DIDT will:

a) Offer training on participatory planning and implementation processes, group formation and dynamics, procurement of goods and services, contracting, financial management, environmental management, and participatory monitoring and evaluation,
b) Offer technical support during formulation, planning, implementation, monitoring and evaluation of the irrigation scheme development projects, and
c) Carry out a needs assessment to identify the required support services and capacity building needs, relating to irrigation scheme development and development of irrigated agriculture and marketing, at village, ward and district levels.

Name	Position	Organization	Signature

Originally proposed by:

……..
Name: (Signature)
Date:
Head of Department dealing with Irrigation (HDI)

On behalf of District Facilitation Team (DFT),

Assigned by:	Endorsed by:
……	……
Name: (Signature)	Name: (Signature)
Date:	Date:
District Planning Officer (DPLO)	District Executive Director (DED)

Form-2 Memo on the results of the kick-off meeting

Title:…… **Kick-off meeting**

Irrigation scheme:……

Village:……**Ward:**……**District:**……

Region:……

Date:……

Time :(Start)……～ (End)……

Venue:……

Summary of discussion and reaction of participants:

Minutes and the list of participants are attached herewith.

Form-3 Participatory Action Plan

No.	ACTIVITY	RESPONSIBLE PART	TIME FRAME	RESOURCES	OUTPUT/RESULTS

Form-4 Participatory Diagnostic Study

No.	AREA	PROBLEM	REASON	SOLUTIONS	RANKING

Form-5 Commitment letter

Commitment Letter
from Scheme Legal Entity to District Council

District Executive Director,

_____ District Council

P.O. Box _____

Dear Sir/Madam:

Re: Committing to Participate in the _____ Irrigation Scheme Development Project

This letter confirms commitment by the_____[Name of the legal entity – irrigators' organization] to participate in the study, appraisal, design/implementation of the envisaged project. We make this commitment in full recognition of the following:

(a) **Understanding:** We understand that:

i. The selection of our scheme does not mean that the investment will automatically be made, as this depends on the outcome of the proposed appraisal/feasibility studies;

ii. If these studies, in which we shall fully participate, show that it is not feasible to undertake the improvements we have proposed, we will accept the results; and

iii. If the proposed project is found to be feasible, a more detailed Project implementation Agreement between the District ,Zonal Irrigation Office and the Project Committee, in which respective responsibilities (financial and/or others) will be specified, will guide the implementation.

(b) **Responsibilities:** Our responsibilities will be:

i. To ensure full participation of all irrigators/beneficiaries of the scheme in the appraisal and the preparation of the proposed project;

ii. To encourage our members to make available all information necessary for the appraisal/feasibility studies;

iii. To provide 2 - 5 % in cash or kind of the funds required to meet cost of appraisal and preparation of the project.

iv. If the proposed project is found to be feasible and the said Project Implementation Agreement is made between the District Council and the Project Committee, to ensure full participation of all beneficiaries of the scheme in the implementation of the proposed project

Request: We request the followings from the District:

i. Assistance in the provision of technical support to the process of appraisal;

ii. Support to capacity building of the stakeholders to enhance their capability for preparation of the project;

iii. Provision of 95 - 98 % of the funds to meet cost of appraisal and preparation of the project; and

iv. If the proposed project is found to be feasible and the said financing agreement is made between the District Council and the Project Committee, technical support to the process of implementation, and support to capacity building of the stakeholders to enhance their capability for implementation.

We hope that the District will accept this undertaking.

Yours sincerely,

(Signature)

Name: (Signature) _____

Date: _____

Executive Secretary

Form-6 Project Implementation Agreement

PROJECT IMPLEMENTATION AGREEMENT
…… IRRIGATION PROJECT

This AGREEMENT, made the……day ……Month…….Year

Between

The District Executive Director,
……District Council,
P.O. Box ……,
…… [Hereinafter called " district council"]

And

The chairperson of the project committee of …… irrigation scheme [Hereinafter called " the committee"]

And

The chairperson of the irrigators organization of…… irrigation scheme [hereinafter called " the irrigators organization"]

And

Zonal Irrigation Engineer,
P.o. Box ……,
…… [Hereinafter called "zonal irrigation office"]

Of the parts

Whereas the four parties are desirous that the work of …… irrigation scheme [hereinafter called "the works"] should be executed smoothly and completely.
NOW THIS AGREEMENT WITNESSES as follows.

1. The council shall be ready to disburse fund for the works approximate amount of …… Tshs. To project committee account number …… the account name is ……..

2. The project committee shall ensure irrigator's organization [of …….] to contribute 20% of total construction cost in kind/labour force by excavating tertiary canals and drainage canal as per design.

3. The project committee shall supervise the works under the instructions of the technical staff from ……District Council and Zonal irrigation Office.

4. The zone irrigation office shall provide the project supervisor and supervision vehicle to ensure quality control of irrigation and drainage infrastructure to be constructed in collaboration with supervisor from …… District Council (SMS Irrigation).

5. The project committee shall handover to irrigator's organization upon completion of works, which shall have fully responsibilities for operation and maintenance of the scheme thereafter.

6. Irrigators Organization (IO) shall contribute and allocate budget (5% of yield) for Operation and Maintenance (O&M) of constructed facilities.

7. Irrigators Organization shall prepare and implement the operation and maintenance plan.

IN WITNESS whereof the parties thereto have caused this agreement to be executed the day ……month…… year……Before written.

In the presence of;

District Executive Director,
Name……Signature……..

Chairperson of the project committee,
Name……Signature……..

Chairperson of the irrigator's organization,
Name……Signature……..

The Zonal irrigation Engineer,
Name……Signature……..

Before the District Lawyer
Name……
Address……
Signature……
Date……

Form 7a Monitoring Sheet before construction

II. Implementation (except Construction Supervision)

Date Filled Out: _____

*Please attach Annex 1: "Time Frame of Implementation Activities

Q2-1 DIDT Team

(1) Member List (Form No.1) ☐ Yes ☐ No

(2) Is IO resisted? ☐ Yes ☐ No

Name of IO _____ ,

No of members _____ , Year of Reg_____

Reg No._____

Q2-2 Project Committee (PC)

(1) Member List ☐ Yes ☐ No

(2) Has PC introduced to DED by village authority? ☐ Yes ☐ No

(3) Bank Account ☐ Yes ☐ No

If "Yes", Bank Name: _____ Account #: _____

Q2-3 Has a water use permit been granted by the Basin Authority? ☐ Yes ☐ No

☐ Permanent

☐ Provisional (Permit# _____)

Date: _____ name of basin _____

Quantity: _____ Liters/sec. _____

Area (ha): _____

☐ Already applied for it but it is not yet granted ☐ Not yet applied for it

Q2-4 Has an action plan been made in cooperation with LGA and IO? (Form -3)

☐ Yes (Date: _____) ☐ No

Q2-5 Were problem identification and prioritization analyzed by LGA and IO?

☐ Yes (Date: _____) ☐ No

Q2-6 Did the IO send "Commitment letter" to DED? (Form 6)

☐ Yes (Date: _____) ☐ No

Q2-7 Did LGA and ZIO submit a feasibility study report (FS report) to NIC for approval?

☐ Yes (Date: _____) ☐ No

Q2-8 Is the Project feasible? ☐ Yes ☐ No

Q2-9 (For Head works) has the construction point been selected among several alternatives conducting site survey?

☐ Yes ☐ No

Q2-10 (For New Schemes Only): Did LGA and ZIO conduct EIA/ESIA study, incl. Environmental Social Management Plan (ESMP) and resettlement for the scheme implementation?

☐ Yes ☐ No

Q2-11 (For New Schemes Only): Has LGA got an EIA /ESIA certificate from National Environmental Management Council (NEMC) for the scheme implementation?

☐ Yes (Date: _____) ☐ No

Q2-12 (For Existing Schemes Only): Has ZIE checked up environmental and social issues by check sheet for implementation of the scheme as per environmental act?

☐ Yes (Date: _____) ☐ No

Q2-13 In case somebody has to surrender his/her agricultural land for construction irrigation facilities, did parties concerned agree to a solution in a written form?

☐ Yes (Date: _____) ☐ No

Q2-14 Was a participatory design made by IO, district and ZIO?

☐ Yes (Date: _____) ☐ No

Q2-15 Was a Project Implementation agreement made in a written form among PC, LGA and/or ZIO?

☐ Yes (Date: _____) ☐ No

Q2-16 Date on which detailed designs (DD) were checked by ZIE and approved by NIRC?

☐ Yes ☐ No

Date: _____ Checked by: _____

Date: Approved by:

Q2-17 Have tender documents been shared between ZIO and LGA?

☐ Yes ☐ No

Q2-18 Was the tendering done on the scheduled day?

☐ Yes ☐ No, it's behind schedule.
(It is re-scheduled on)

*Please attach Annex 2 : "Time Frame of Tendering"

Q2-19 Did LGA involve ZIO in the evaluation committee of the tendering process?

☐ Yes ☐ No

Q2-20 Have the check points been taken into consideration for the evaluation?

☐ Yes ☐ No

Q2-21 Has LGA informed ZIO of the tendering result?

☐ Yes ☐ No

Winning Bidder: _____

Amount of Contract: ☐ Tsh.

Form 7b: Monitoring during construction

III. Construction (Month _____ **Date Filled Out:** _____

Structures to be built: 2ndary canal #1& canal structures

Scheme Name: _____ Zone: _____

Region:_____ District:_____ Contract Amount:_____Tsh

1. Contract #: _____ Date: _____

2. Contractor: _____ Nationality: _____

3. Construction Period: From _____To_____ (days)

4. Project Manager: _____ Organization: _____

5. Submission: Monthly Progress Report from PM to DED and ZIE ☐ Yes ☐ No

Monthly Report from Contractor to PM ☐ Yes ☐ No

PC Report, inclusive of the Simplified Check List

☐ Yes, everyday ☐ Yes, but not every day (_____)

☐ No ☐ Reports were without the Simplified Check List.

Measurement Sheets signed by PM and Contractor ☐ Yes ☐ No

6. Participants of Joint Site Inspection: ☐ Contractor ☐ PM ☐ PC ☐ DAICO

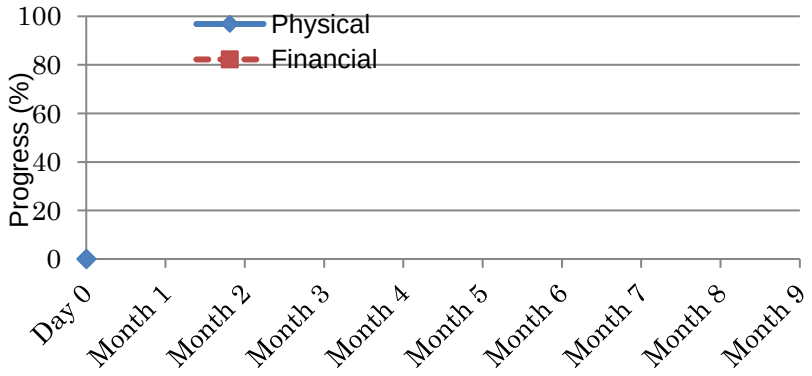
☐ DIE/SMS-irrigation ☐ IO ☐ Village representative

7. Payment made: ☐ Yes, Amount paid (_____ Tsh.) Date (_____)

☐ No, no payment was made.

8. Progress

	Day 0	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9
Physical	0.0%									
Financial										



Comments on Progress:

Dimension of as built structures are within allowable errors ☐ Yes ☐ No
If "No", specify instructions to the contractor

10. Accident in the site: ☐ Yes ☐ No 11. Natural Disaster: ☐ Yes ☐ No

12. Chang of design: ☐ Yes ☐ No 13. Contract amendment: ☐ Yes ☐ No

14. Remarks on the above, if any

Form 8 Activity Check Form (New Style)

	District	Scheme	Fund	PC formation	PC account	DIDT formation	Water use permit	Action planning	Diagnostic study	Commitment Letter	Feasibility study	Operation planning	Maintenance planning	O& M Budget Plan	General Meeting	Project implementation agreement	Detailed design	Tender documentation	Tendering	Contract award	Construction	Operation record	Water Distribution Plan	Maintenance record	Financial record	Collection of ISF	Reporting format
Mwanza	Karagwe DC	Mwisa	SSIDP	Yes	Yes	Yes	In process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5%	No	No	No	No	No	No
	Bunda DC	Nyatwali	SSIDP	Yes	Yes	Yes	In process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
	Bunda DC	**<u>Malivanda</u>**	SSIDP	Yes	Yes	Yes	In process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	43%	No	No	No	No	No	No
	Shinyanga DC	**<u>Nyida</u>**	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	48%	No	No	No	No	No	No
	Misungwi DC	Igenge	NIRC	Yes	N/A	Yes	In process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	In process	No	No	No	No	No	No	No
	Kwimba	**<u>Mahiga</u>**	TANCAID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	N/A	N/A	N/A	98%	No	No	No	No	No	No
Tabora	Igunga	**<u>Mwalumili</u>**	SSIDP	Yes	Yes	Yes	In process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	98%	No	No	No	No	No	No
Dodoma	Hanang	**<u>Endagaw</u>**	NIRC	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	In process	No	No	No	No	No	No	No
	Simanjiro	**<u>Ngage</u>**	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100%	No	No	No	No	No	No
Morogoro	Mvomero	Kigugu	ERPP	No	No	Yes	In process	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes(MoU)	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
	Kilosa	Mvumi	ERPP	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes(MoU)	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
	Kilombero	Njage	ERPP	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes(MoU)	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No
Mbeya	Busokelo	Kateh Ntaba	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	70%	No	No	No	No	No	No
	Busokelo	**<u>Mbaka</u>**	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	51%	No	No	No	No	No	No
	Kilolo	**<u>Mgambalenga</u>**	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	35%	No	No	No	No	No	No
	Mbarali	Madibira	REGROW	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No
Mtwara	Liwale DC	**<u>Ngongowele</u>**	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	28%	No	No	No	No	No	No
	Lindi DC	Kinyope	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	66%	No	No	No	No	No	No
	Ruangwa DC	Nanganga	SSIDP	Yes	Yes	Yes	In process	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	21%	No	No	No	No	No	No
	Ruhuhu	Nyasa	AfDB	No	No	Yes	In process	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Lundo	Nyasa	NIRC	No	No	Yes	In process	No	Yes	No	Partial	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Kilimanjaro	Moshi	Soko	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100%	No	No	No	No	No	No
	Siha	Orumwi	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	5%	No	No	No	No	No	No
	Mwanga	Kirya	NIRC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	In process	No	No	No	No	No	No	No
	Lushoto	Kwemgiriti	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100%	No	No	No	No	No	No
	Lushoto	Kitumi mwezae	SSIDP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100%	No	No	No	No	No	No

Activity check form (Summary) 1 (Preparation Stage)
*Bold & Underlined; Dissemination site

SECTION 4 TECHNICAL GUIDANCE

Section 4-1 Explanatory Notes

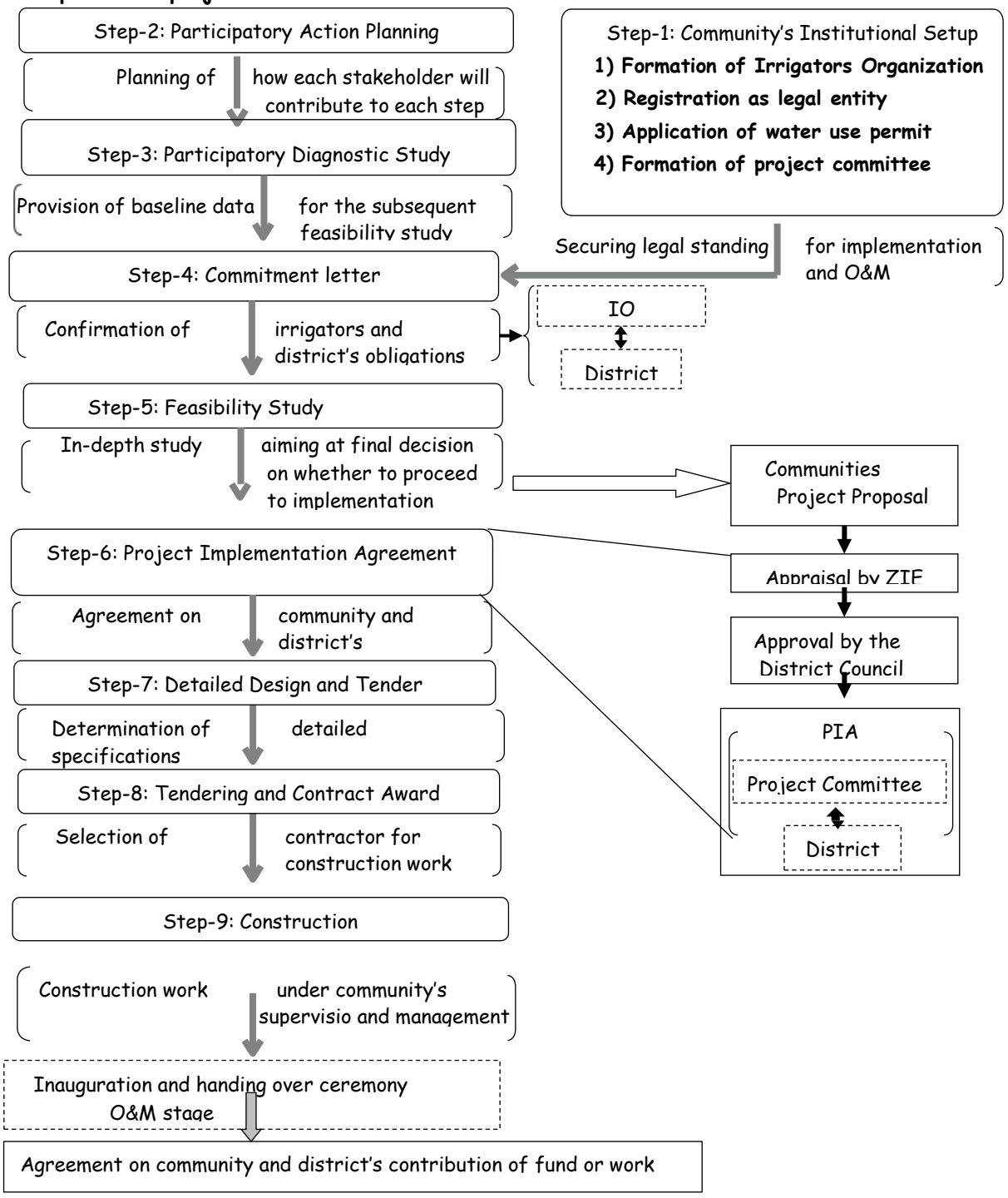
Explanatory Note 1: Issues to be explained at the kick-off meeting

It is recommended that the DIDT prepare a paper written in Kiswahili explaining the issues (to be covered in this section) and distribute this paper to the participants at the meeting. The following are the issues to be explained at the kick-off meeting.

1) Selection of the irrigation scheme

- The relevant irrigation scheme in the village has been selected and approved as the candidate to proceed to the implementation stage.
- However, there is a possibility that the investment will be cancelled, depending on the results of the feasibility study to be carried out before the Project Implementation Agreement between the community – the project committee – and the District Council.

Steps of the project activities



Step	Objective
Step-1: Community's institutional setup (This step does not have to be completed before entering Step-2, but it must be completed before entering Step-4.)	Securing legal standing for implementation, operation and maintenance • Formation of the project committee • Formation of the irrigators' organization • Establishment of the committee for the irrigators' organization (IO) • Applying for registration • Getting the certificate of registration • Applying for permit to use water
Step-2: Participatory action planning (= First planning workshop)	Planning of how each category of stakeholders contributes to each step of project activities • Review of outputs of O&OD and formulation of activities • Discussion on responsibilities and laying down the schedule for project activities • Compilation of an action plan.
Step-3:Participatory diagnostic study (= Second planning workshop)	Provision of baseline data for the subsequent feasibility study. • Understanding the current situation surrounding the scheme and the village through analysis of strength, weaknesses, opportunities and threats (SWOT). • Identification of measures, solutions and strategies
Step-4: Commitment Letter	Writing a Commitment Letter to the District Council, confirming the irrigators' and the district's obligations as listed below: • That the community understands that the investment may not be made, depending on the results of the feasibility study. • That the community will fully participate in project preparation (= feasibility study) and project implementation. • That the community will contribute not less than 20 %, and the district will contribute yy % of the fund for the preparatory stages of the project (= feasibility study). • That the district will provide necessary technical support to project activities as well as support capacity building of stakeholders.

Step	Objective
Step-5: Feasibility study/ Participatory design	In-depth study aiming at final decision of whether to proceed to implementation, and writing up of the community's project proposal. • Clarifying technical, social, economic, environmental and financial issues relating to the project, based on the collected baseline data of current situations. • Clarifying measures to cope with those issues. • Carrying out a topographic survey and preparing a preliminary design. • Preparing a proposal/framework for implementation, management, operation & maintenance, monitoring and evaluation. • Writing up the project proposal and submitting it to the District Council.
Step-6:Project Implementation Agreement	Agreement on the community and the district's contribution in the implementation of the proposed project. • Appraisal of the community's project proposal by Head of Department dealing with Irrigation (HDI) • Approval of the community's project proposal by the District Council • Signing of the Project Implementation Agreement between the project committee and the District Council
Step-7:Detailed design and tender documentation	Determination of the detailed specifications of the facilities and the works. • Preparation of a detailed design of the proposed irrigation and other relevant facilities • Preparation of tender documents for selection of a contractor
Step-8:Tendering and contract award	Awarding tender to a contractor for irrigation facilities and other relevant facilities.
Step-9: Construction	Proceeding, under the supervision and management of the community, with the construction of irrigation facilities and other relevant facilities.

After the completion of the construction work in Step-9, the project enters the operation and maintenance stage after the inauguration and handing over ceremony. The project committee will hand over the project to the irrigators' organization (IO).

3) Community's role

- The community will play a leading role in all of the above steps.
- The district will provide necessary technical support to project activities as well as support capacity building of stakeholders.
- A ZITSU staff will be an assisting member of DIDT.
- Through the district, the community will seek technical assistance from ZIO/RIO in survey and feasibility study, designing, construction supervision and management.
- If necessary, the community, with the assistance of the district, will hire a private consultant/NGO for technical assistance in survey and feasibility study, designing, construction supervision and management.

4) Tentative schedule of the steps

Step	Schedule	
	Month / year of start	Month / year of completion
Step-1, 2 and 3: Institutional setup and planning workshops		
Step-4: Commitment Letter		
Step-5: Feasibility study		
Step-6: Project Implementation Agreement		
Step-7:Detailed design and tender documentation		
Step-8:Tendering and contract award		
Step-9: Construction		

Explanatory Note 2: Position of Step- 1 s: Community's Institutional Setup

Here, the suffix "s" of Step-1s means support activity.

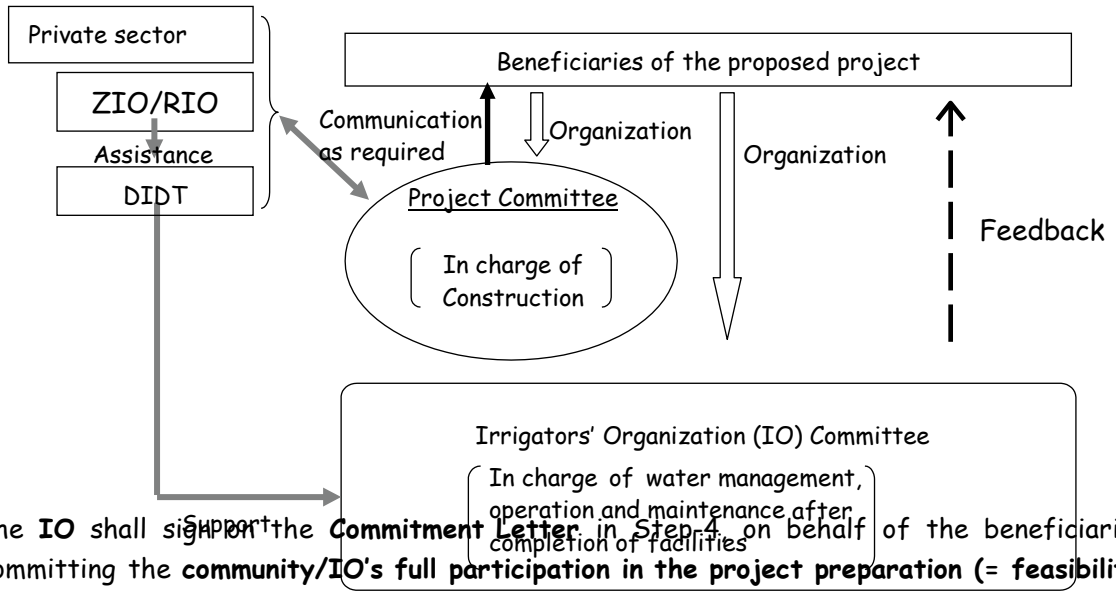
This Step-1s: Community's Institutional Setup does not have to be completed before entering Step-2: Participatory Action planning, but shall be completed before entering Step-4: Commitment Letter.

The DIDT can brief the community on the community's institutional setup to the community at the kick-off meeting in Step-1: Scheme Awareness Campaign.

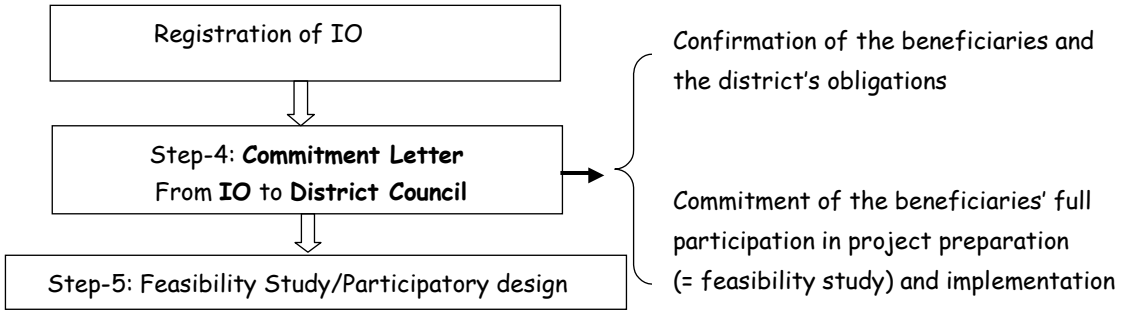
Explanatory Note 3: The meaning and objectives of community's institutional setup

The project committee is responsible for smooth implementation of the project, in collaboration with DIDT, and as required, communicating with ZIO/RIO and the private sector.

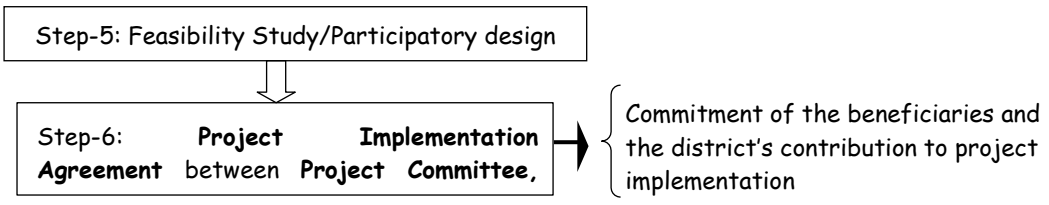
The Irrigators' Organization (IO) is responsible for water management, operation and maintenance after completion of irrigation facilities and other relevant facilities.



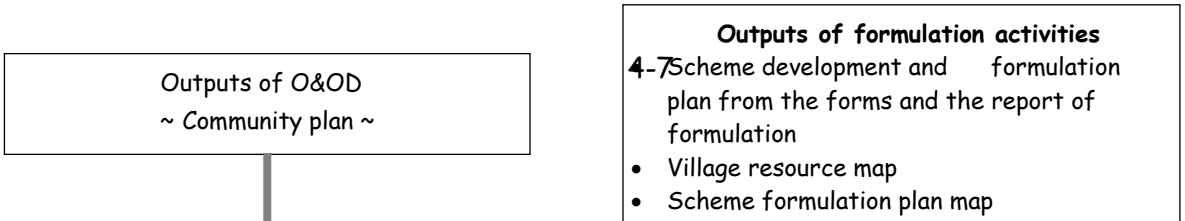
The **IO** shall sign on the **Commitment Letter** in Step-4, on behalf of the beneficiaries, Committing the **community/IO's full participation in the project preparation (= feasibility study) and implementation**, after the IO is registered, and before starting the feasibility study in Step-5

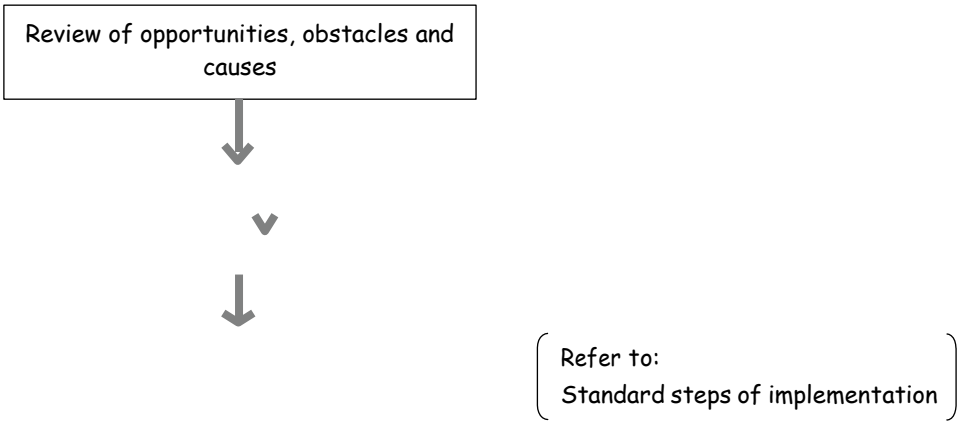


After the proposed project is found to be feasible in the feasibility study in Step-5, the **project committee** shall sign the Project Implementation Agreement with the District Council in Step-6, **committing the community and the district's contribution to project implementation**.



Explanatory Note 4: Flow of action planning




Review of opportunities, obstacles and causes
Refer to:
Standard steps of implementation

Explanatory Note 5: How to use the outputs of O&OD and formulation activities

The irrigation-related plan of intervention will be extracted from the outputs of O&OD exercises. It will be a basis of the community's project proposal.

Outputs of O&OD

Community Plan

Village_____ Ward _____

District_____ Region_____

Target under TDV2025:_____

Objective:_____

Specific objective	Opportunity	Obstacle	Cause	Interven-tion	Steps of implement - ation	Inputs	Cost			Priority	Indica-tors
							Total	Internal	External		

Three Year Community Development Plan (VDP/WDP)

Village_____ Ward _____

District_____ Region _____

Target under TDV2025:_____

Objective:_____

Priority	Specific objective	Steps of implement-ation	First year		Second year		Third year	
			What village can do	What village cannot do	What village can do	What village cannot do	What village can do	What village cannot do

Irrigation related extract from outputs of O&OD

Specific objective	Opportunity	Obstacle	Cause	Interven-tion	Steps of implement - ation	Inputs	Cost			Priority	Indica-tors
							Total	Internal	External		

⇩

Review

Also, the outputs of the formulation activities will be reviewed.

Outputs of formulation activities (1) (From Form-12: Scheme digest)

3. Development Plan

3.1 Irrigation System Development Plan

(1) Development area : _____ ha

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

(3) Name of the water source :

(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/Intake ☐ Concrete ☐ Gabion
(including rehabilitation) : Pump _____ nos.
: Main Canal/Structures ☐ Lined ☐ Unlined _____ km
(except facilities in the development area) : Flood dike _____ km
: Village access road _____ km
: Village bridge/Crossing _____ m in total

3.2 Agriculture Development Plan

(1) Dry season : Cropped area _____ ha ☐ Paddy ☐ Maize ☐ Vegetable

(2) Rainy season : Cropped area _____ ha ☐ Paddy ☐ Maize ☐ Vegetable

(3) Annual incremental annual agricultural benefit : _____ Tsh.

3.3 Institutional Development Plan

(1) Establishment : by year

(2) Type of organization : ☐ Irrigators' Organization ☐ Farmers' Group

(3) Registration : by year

(4) Law : ☐ Association Act ☐ Cooperative Act ☐ Nation Irrigation Act

(5) Letter of undertaking : by year

3.4 Social / Environment

☐ Water conflict within the scheme/village
☐ Water conflict with other scheme/village
☐ Land conflict ☐ Effect on protected area ☐ Soil erosion in the scheme
☐ Salinity ☐ Siltation ☐ Deforestation
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/Rehabilitation : _____ Tsh.

(2) Soft component : _____ Tsh.

(3) Administration : _____ Tsh.

(4) Engineering : _____ Tsh.

(5) O&M : _____ Tsh

(6) Replacement : _____ Tsh.

TOTAL : _____ Tsh

Outputs of formulation activities (2) (From Form-14: Summary of Scheme Formulation Plan)

1) Scheme Development Plan Name of the scheme

1. **Overall Scheme Development Cost** (can be obtained from **Form-12**)

(1) Construction/Rehabilitation : _____ Tsh.

(2) Soft component : _____ Tsh.

(3) Administration : _____ Tsh.

(4) Engineering : _____ Tsh.

(5) O&M : Tsh.

(6) Replacement : _____ Tsh.

2. **Scheme Cost**

(a) Investment cost : _____ Tsh. Total of (1) to (4) of 1.

(b) Farmers' contribution : _____ Tsh. Standard is 20% of 1. (1)

(c) District Council : 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 : _____ Tsh. in fiscal year _____

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 : Tsh. (should be same as (c) in 2.)

Scheme development cost for this year _____ Tsh.

Three year plan from the outputs of O&OD

Tentative schedule of the project activities explained at the kick-off meeting

Review of intervention, steps of implementation, inputs and cost

Standard steps of implementation

1) Letter of undertaking
2) Topographic survey
3) Feasibility study
4) Detailed design
5) Tendering and contract
6) Construction of xxxxxxxxxx
7) Construction of xxxxxxxxxx
8) Construction of xxxxxxxxxx

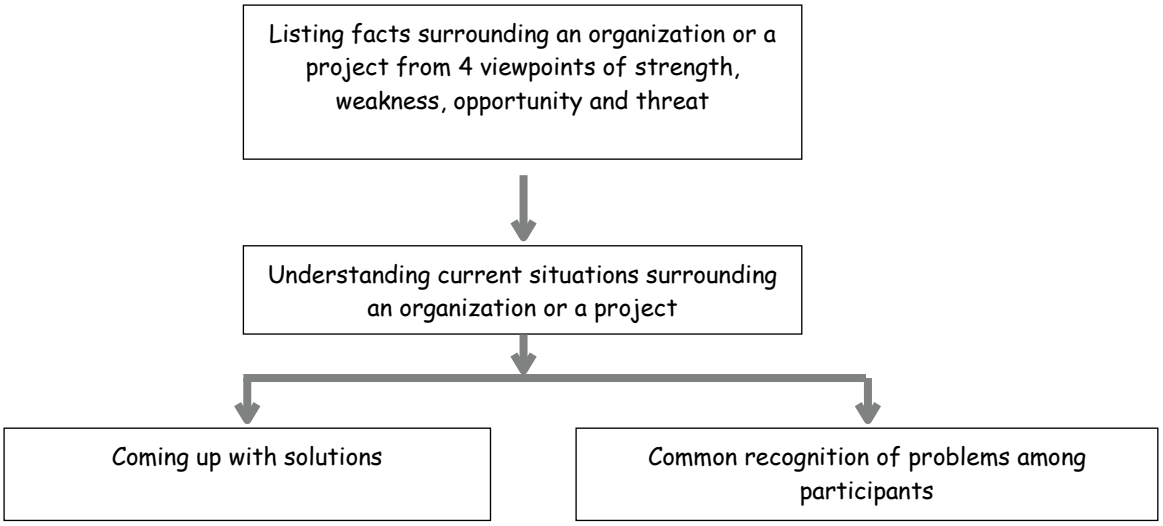
Action Planning (Form-3)

- Identification of responsibilities of each category of stakeholders
- Identification of time frame, cost and funding source
- Identification of necessary technical support

Explanatory Note 6: What is SWOT analysis and how to use it in PDS?

What is SWOT analysis?

SWOT analysis method is a tool which is commonly used to list facts from 4 viewpoints of strength, weakness, opportunity and threat, and to understand current situations surrounding an organization or a project. It helps participants come up with solutions and share the recognition of problems.



Strength and weakness represent internal conditions, i.e., conditions inside an organization or a project, and which we can change or improve by ourselves. Also, note that strength and weakness shall be relatively evaluated in comparison with other organizations or other projects.

Internal factor	Meaning
Strength	An organization's or a project's characteristics which are superior to other organizations or other projects.
Weakness	an organization's or a project's characteristics which are inferior to other

Opportunity and threat represent external conditions, i.e., conditions outside an organization or a Project, and which we cannot change or improve by ourselves.

External factor	Meaning
Opportunity	External conditions which enhance the performance of an organization or a project.
Threat	External conditions which limit or prevent the improvement of the performance of an organization or a project.

Objectives of participatory diagnostic study (PDS) using SWOT

We utilize O&OD method in village planning and ward planning prior to preparation of ISD. Participatory diagnostic study (PDS) is similar to O&OD in terms of discussing opportunities (or strengths), obstacles (or weaknesses, threats) and resources which the village has.

The differences between O&OD exercises and PDS are shown below. The PDS aims at discussing irrigation-related issues and understanding current situations surrounding irrigated agriculture in the village

O&OD exercises	⇔	Participatory diagnostic study (PDS)
• Covering any aspects of issues surrounding the village • Using various participatory planning tools • Aiming at concrete planning		• Focusing on issues specific to irrigation, irrigated agriculture and marketing • Only making discussions among participants • Aiming at understanding of current situations

The objectives of the PDS using SWOT analysis method are:

- To understand current situations relating to irrigation, irrigated agriculture and marketing surrounding the specific irrigation scheme in the specific village.
- To provide baseline data for the subsequent feasibility study.

In Step-2: Participatory Diagnostic Study (PDS), the 4 factors of strength, weakness, opportunity and threat will be interpreted as follows:

Factor	Meaning
Strength	Resources which the community has, and which help develop irrigation, irrigated agriculture and marketing around the specific irrigation scheme and the specific village.
Weakness	Lack of resources needed to help develop irrigation, irrigated agriculture and marketing around the specific irrigation scheme and the specific village.
Opportunity	Circumstances surrounding the specific irrigation scheme and the specific village which enhance the performance of irrigation, irrigated agriculture and marketing.
Threat	Circumstances surrounding the specific irrigation scheme and the specific village which limit or prevent the improvement of the performance of irrigation, irrigated agriculture and marketing.

Steps of PDS

The participatory diagnostic study follows the steps shown below:

(1) Listing of facts – strengths, weaknesses, opportunities and threats, using **Form-4**
(2) Finding out future possible measures, solutions and strategies to cope with the situations shown in the list of facts, using **Form-5**

In **Form-4**, strengths, weaknesses, opportunities and threats will be categorized into natural environment, economical features, social features and human resources, and technical features.

An example is given below:

	Internal Conditions		External Conditions	
	Strength	**Weakness**	**Opportunity**	**Threat**
Natural Environment	High potentiality of water source	Low fertility of farmland		Frequent drought Soil erosion Floods
Economic features		Low productivity of rice	Accessibility to local market near the village Positive government policy on irrigation development	Little Government budget High cost of agricultural inputs Little production activities other than agriculture
Social features and human resources	Young people's high level of education Some young people who may be village leaders in the future	Low level of education in general	Support from village government Good communication among the district, the village and the farmers' groups NGOs interested in small scale irrigation development	Wide-spreading HIV/AIDS
Technical features	Well maintained traditional irrigation scheme	Low level of farming techniques	High level of extension workers	

From the above list of SWOT, the participants will present as many ideas of the measures, Solutions and strategies as possible, using the matrix format of **Form-5** as shown below:

List of measures, solutions and strategies

	Opportunity	**Threat**
Strength	How to utilize strengths to exploit opportunities	How to utilize strengths to overcome threats
Weakness	How to avoid overlooking opportunities because of existence of weaknesses	How to avoid the worst case which will possibly be generated from weaknesses and threats

.

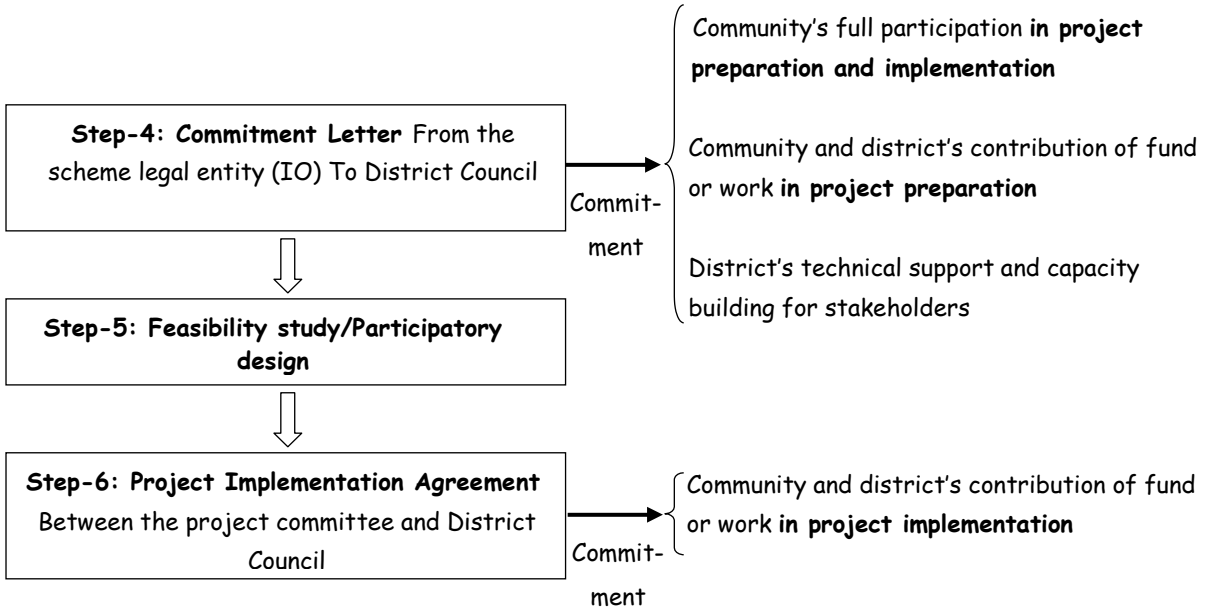
Explanatory Note 7: Contents of commitment letter.

Major issues to be committed by the scheme legal entity – irrigators' organization (IO), and to be requested from the legal entity to the district, are:

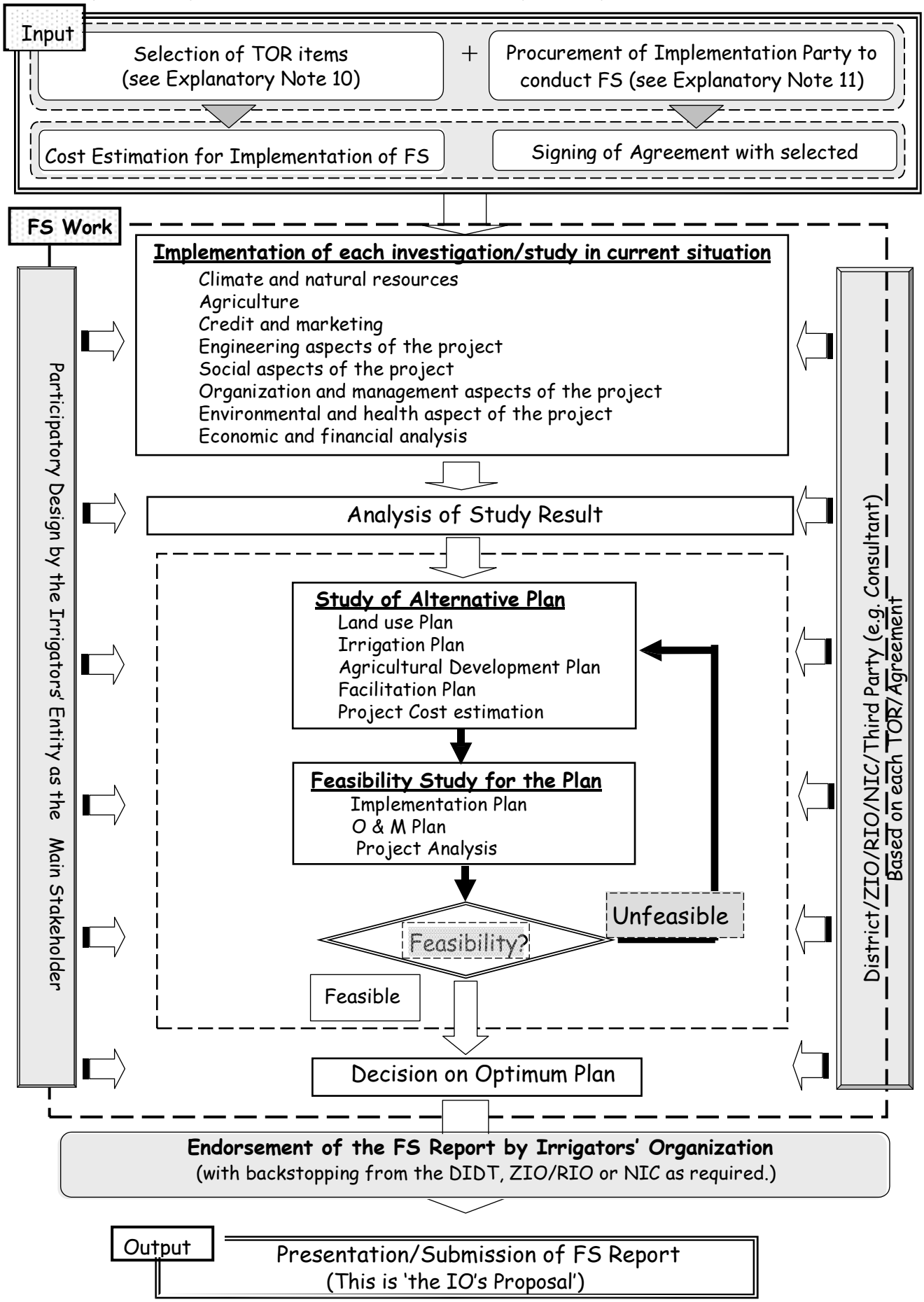
- The community understands that the investment may not be made, depending on the results of the feasibility study.
- The community will fully participate in the project preparation (= feasibility study), and after the proposed project is found to be feasible, in the project implementation.
- The community will contribute 2 – 5 %, and the district will contribute 95 - 98 % of the fund or the work for the project preparation (= feasibility study).
- The district will provide necessary technical support to the project preparation and implementation as well as support to capacity building of stakeholders for project preparation and implementation.
- The community will be responsible for O&M.

In the **Commitment letter**, the IO will commit the contribution of necessary fund or work **in only project preparation (= feasibility study) stage**.

The contribution of fund or work **in the implementation stage** by the community and by the district will be committed in the **Project Implementation Agreement** after the feasibility study.



Explanatory Note 8. Flow of Feasibility Study (FS)



Explanatory Note 9.Design Activities for Main Irrigation System to be studied in FS Level as a Reference

Field	Activities to be studied
Location Topography	- Aerial photography at 1:10,000 or topographic survey at 1:5,000 scale of irrigation area; - Survey specification for detailed design - Site plans for major structures
Soils Agriculture	- Semi-detailed soil and land capability survey with map at 1:250,000 - Agricultural plan - Farm studies
Hydrology, Water	- As reconnaissance study - Basin water balance study - Simulation study on water availability and requirement
Geotechnical Aspects	- Limited geotechnical investigations of major structure sites with drilling as necessary - Sampling along canal alignment and at structure sites - Construction materials; borrow area; quarry investigations - Laboratory tests on selected samples to determine engineering
Engineering Design	- Design of final layout, canals and structures - Types of structures with typical structural design - Design capacities - Check alignment and elevation of canals at every 400m - Preliminary BoQ and cost estimate
Multi-Sector Aspects	- As reconnaissance study; with detail at feasibility study level phasing of multi-sector project components
End Products	- Water requirements - Irrigable area - Crop and crop calendar - Layout of irrigation system - Preliminary design of canals and structures - Typical structures - Bill of Quantities and Cost estimate - Cost/Benefit Ratio and Internal Economic Rate of Return - Analysis of environmental impact (EIA) of proposed project
Conclusion Recommend-ation	- With final irrigation layout and proven feasibility, continue with detailed design - Collect additional data for detailed design - Prepare detailed investigation and survey
Level of Accuracy	- Engineering 75% - Cost 90%

Source: Chapter 1, Irrigation Design Manual Vol.1 of 2 (MOAC)

Explanatory Note 10. Items to be investigated or studied in FS and selection of the FS type

The main specific items to be studied or investigated in FS level are shown in the following Table. Depending on each ISD, each Irrigators' Organization (IO) should select a proper FS type after checking these specific items as TOR, and finally in cooperation with DIDT.

Table: Items to be studied/investigated in FS and Selection of the FS type

Survey Items	Main Specific Items	General Items	Essential Items	Your Choice
1. Climate and natural resources	Climate	O		
	Topography	O		
	Soil	O	+	
	Water	O		
2. Agriculture	Existing farm practices	O		
	Land tenure	O	+	
	Proposed agricultural system	O		
3. Credit and marketing	Credit for high-input & output	O		
	Marketing potentials	O	+	
4. Engineering aspects	Preparation of plan	O		
of the project	Agriculture development plan	O		
	Facility plan	O		
	Project cost estimation	O		
	Implementation plan	O		
5. Social aspects of the	Population	O		
project	Literacy	O		
	Farming knowledge and skills on irrigation	O	+	
	Gender issue	O		
6. Organization and	The organization of planning and	O		
management aspects	construction			
of the project	The organization of operation, maintenance and management	O		
	Extension services	O	+	
7. Environment and health	EIA (refer to Sub-step 5)	O		
aspect of the project	Water-related diseases	O		
8. Economic aspect	Economic analysis	O		
9 Financial aspect	Financial analysis	O		

Note) O : Mandatory Item in each Type, + : Desirable Item in Simplified Type

As premises of the FS implementation, TORs should be prepared by the District with backstopping of ZIO/RIO, and others.

As the sample, following TORs are attached in Appendix 5-2.

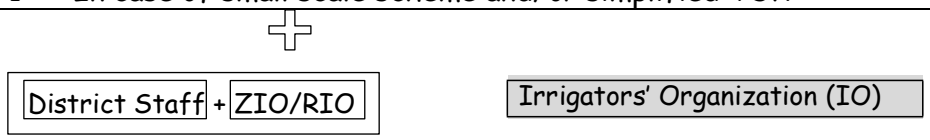
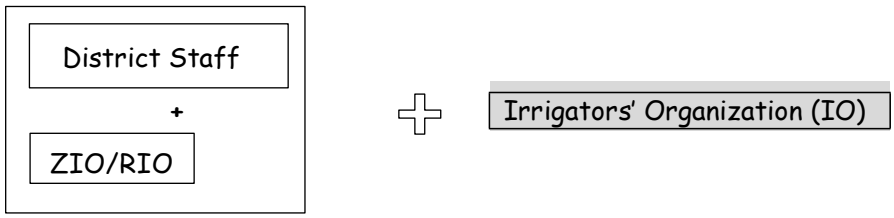
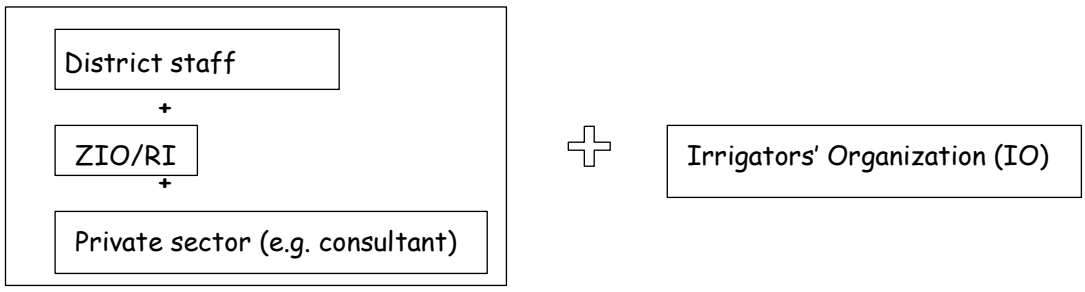
(1) TOR for Topographic Survey Work
(2) TOR for Consultancy Services
(3) TOR and Cost Estimation for Implementation of FS

Explanatory Note 11. Selection of Pattern of FS Implementation

FS should be conducted by various types of responsible parties based on each Agreement or Contract.

In the ISD, the FS types categorize the following three cases depending on the constituent member undertaking the FS. The irrigators' organization member should participate in these FS as a direct stakeholder in each case by applying 'Participatory Design Manner' (look at Box 2).

Classification of FS depending on implementation pattern

Case 1: In case of small scale scheme and/or simplified TOR

Case 2: In case of medium scale scheme and/or excluding special TOR item such as a required specialist (e.g. consultant) from the private sector

Case 3; In case of large scale scheme and/or including many TOR items such as a required specialist (e.g. consultant) from the private sector


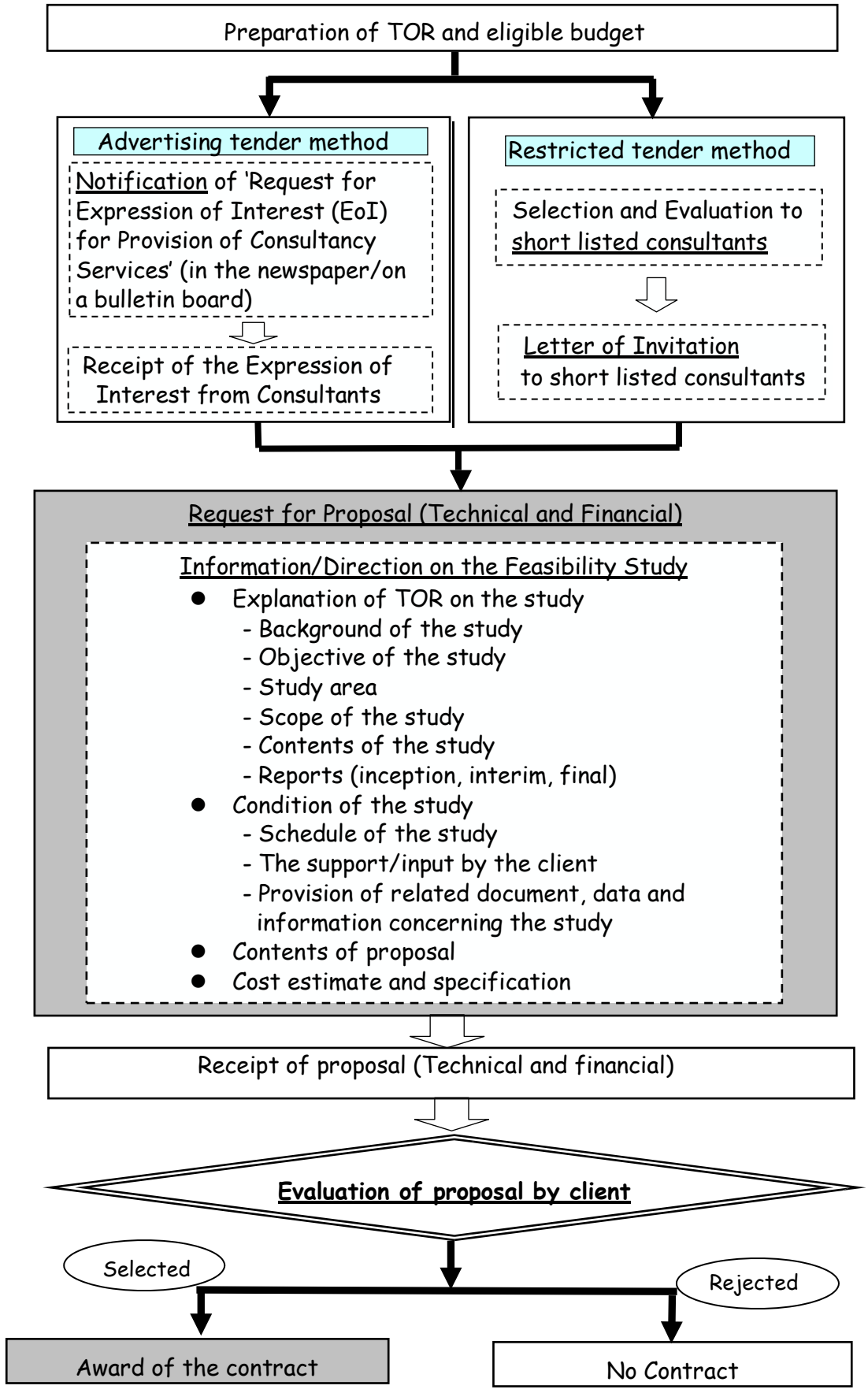
Box 2

The aim of Participatory Design Approach

Stakeholder's participation in the design is essential to allow them to influence the outcome and to ensure that indigenous knowledge and irrigators' technical skills are taken fully into account.

Thus, to carry out a Feasibility Study (FS) by applying such participatory manner is a significant approach in the irrigation scheme implementation.

Explanatory Note 12. Procedure for Procurement of Consultants in FS Stage



Explanatory Note 13. General Contents of Proposal to Request for Consultants

1. Study experience and capability of the Consultant
   (1) Order situation from NIRC/ZIO/RIO/LGAs
   (2) Experience on a similar study
   (3) Study experience at objected District or Zone
   (4) Information on the study
   (5) Supporting system of the study
   (6) Finance condition (Statement of income etc.)
   (7) Other information

2. Operation policy of the study
   (1) Basic policy of the study
   (2) Method of the study
   (3) Study schedule
   (4) Staffing schedule
   (5) Work responsibility of each staff
   (6) Required material and equipment
   (7) Detailed design and supervision system
   (8) Others

3. Work experience of staff
   (1) Name list of assigned staff
   (2) CVs of assigned staff

4. Cost Estimates

As regarding selection and employment of consultants, refer to 'STANDARD REQUEST FOR PROPOSALS (Central Tender Board, Ministry of Finance)' .

Besides, as for selection and employment of consultants, refer to 'Guidelines on the Evaluation of Technical and Financial Proposals and Preparation of Evaluation Reports (Public Procurement Regulatory Authority (PPRA)'.

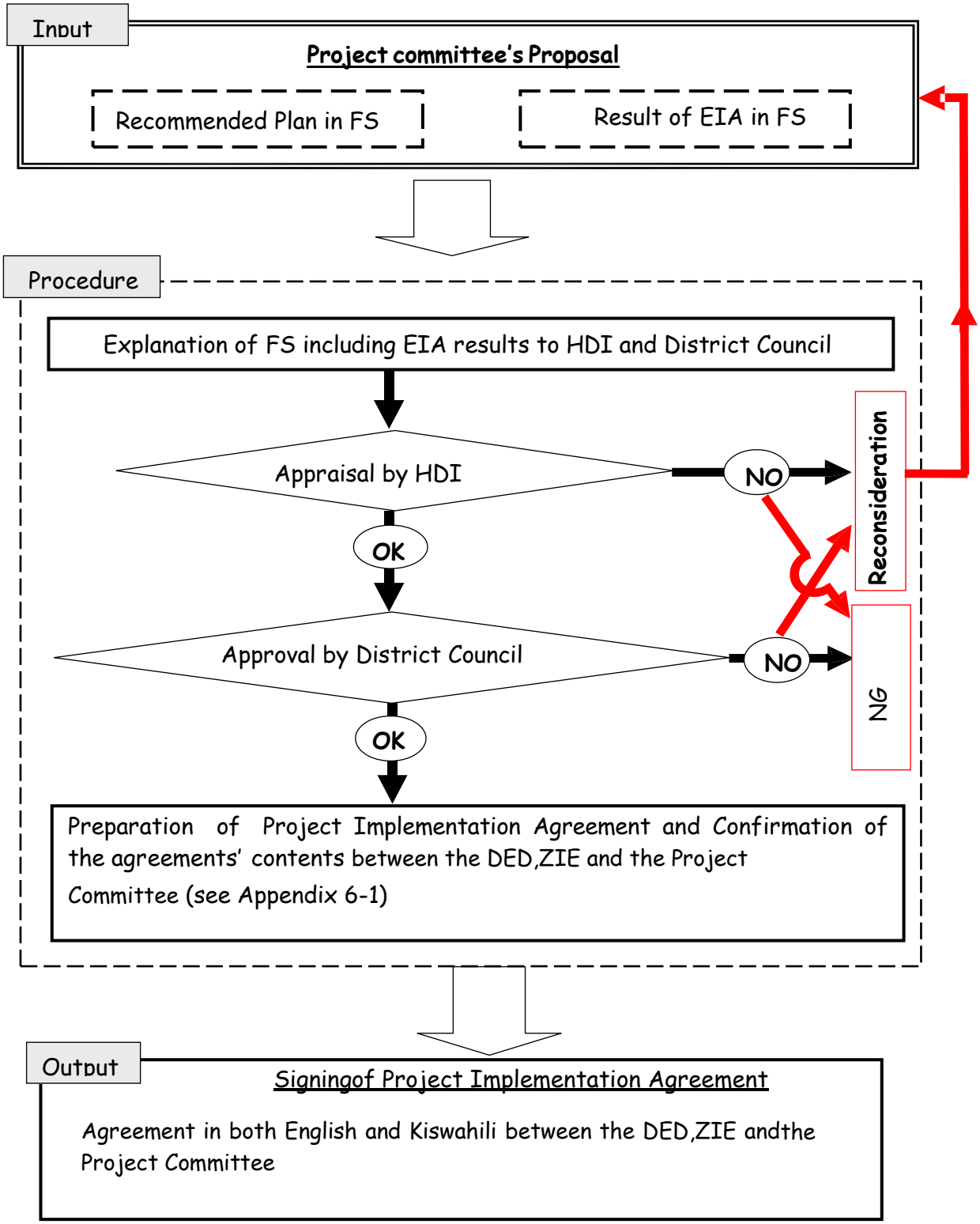
Explanatory Note 14. General contents in FS report to be presented

Chapter 1.	Executive Summary
Chapter 2.	Background
Chapter 3.	Location
Chapter 4.	Land resources
Chapter 5.	Water resources
Chapter 6.	Climate
Chapter 7.	Agriculture
Chapter 8.	Irrigation
Chapter 9.	Social aspects
Chapter 10.	Credit and marketing
Chapter 11.	Engineering requirements
Chapter 12.	Environmental issues
Chapter 13.	Organization, maintenance and management
Chapter 14.	Capital Cost
Chapter 15.	Implementation project and construction plan
Chapter 16.	Operation and maintenance cost
Chapter 17.	Economic and financial analysis
Chapter 18.	Conclusions and recommendations

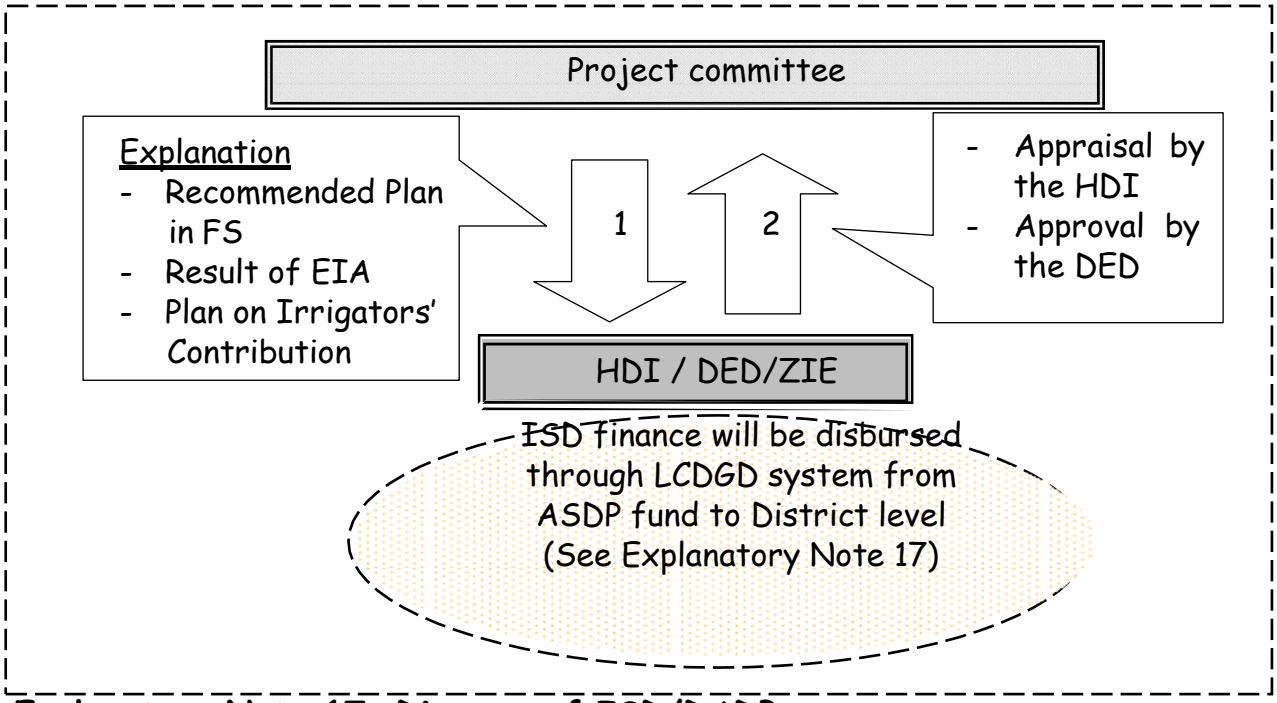
Source: Chapter 6, Irrigation Manual Vol.1 / FAO

The main volume of the Feasibility Study report should preferably be prepared in English. However, especially pertaining to the executive summary should be prepared in Kiswahili to facilitate participation by the IO in the approval and implementation of its recommendations.

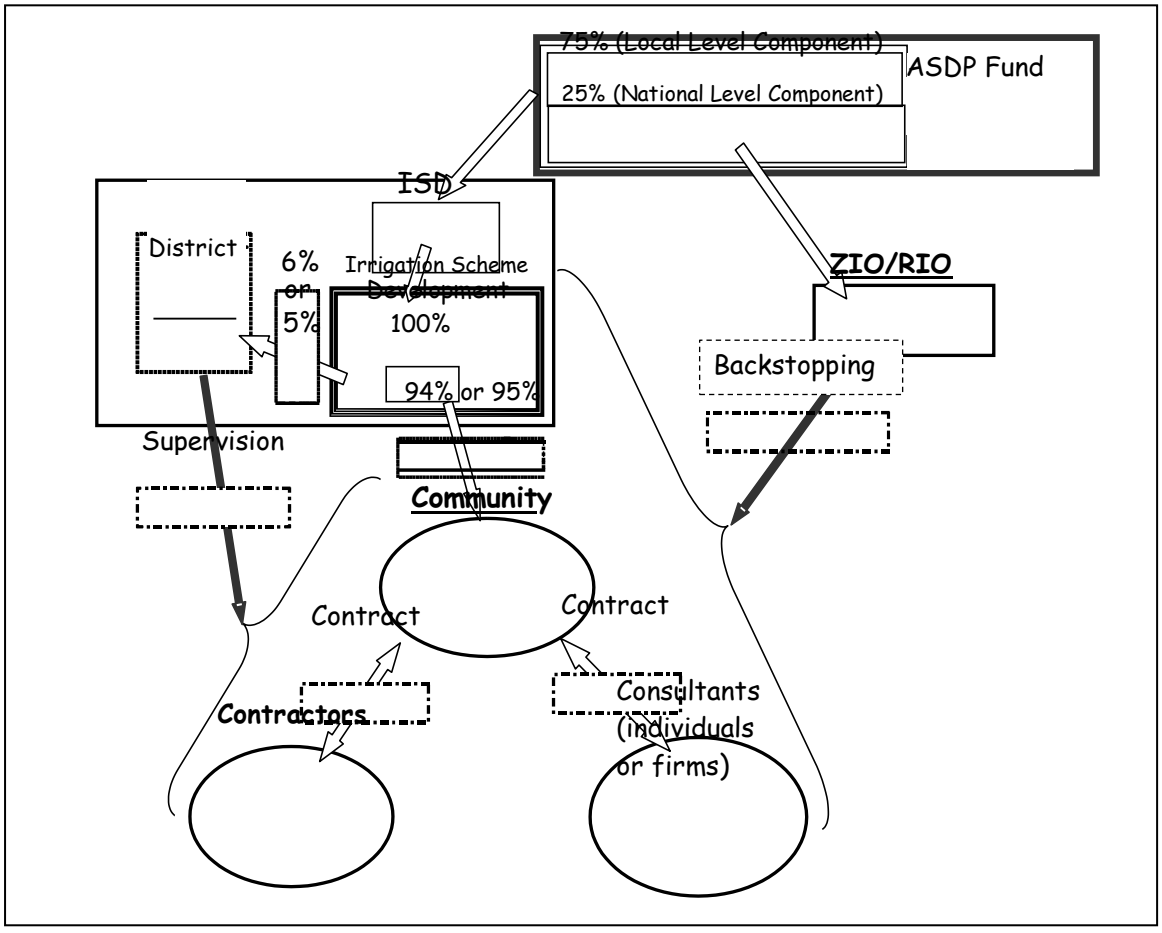
Explanatory Note 15. Flow of Project Implementation Agreement



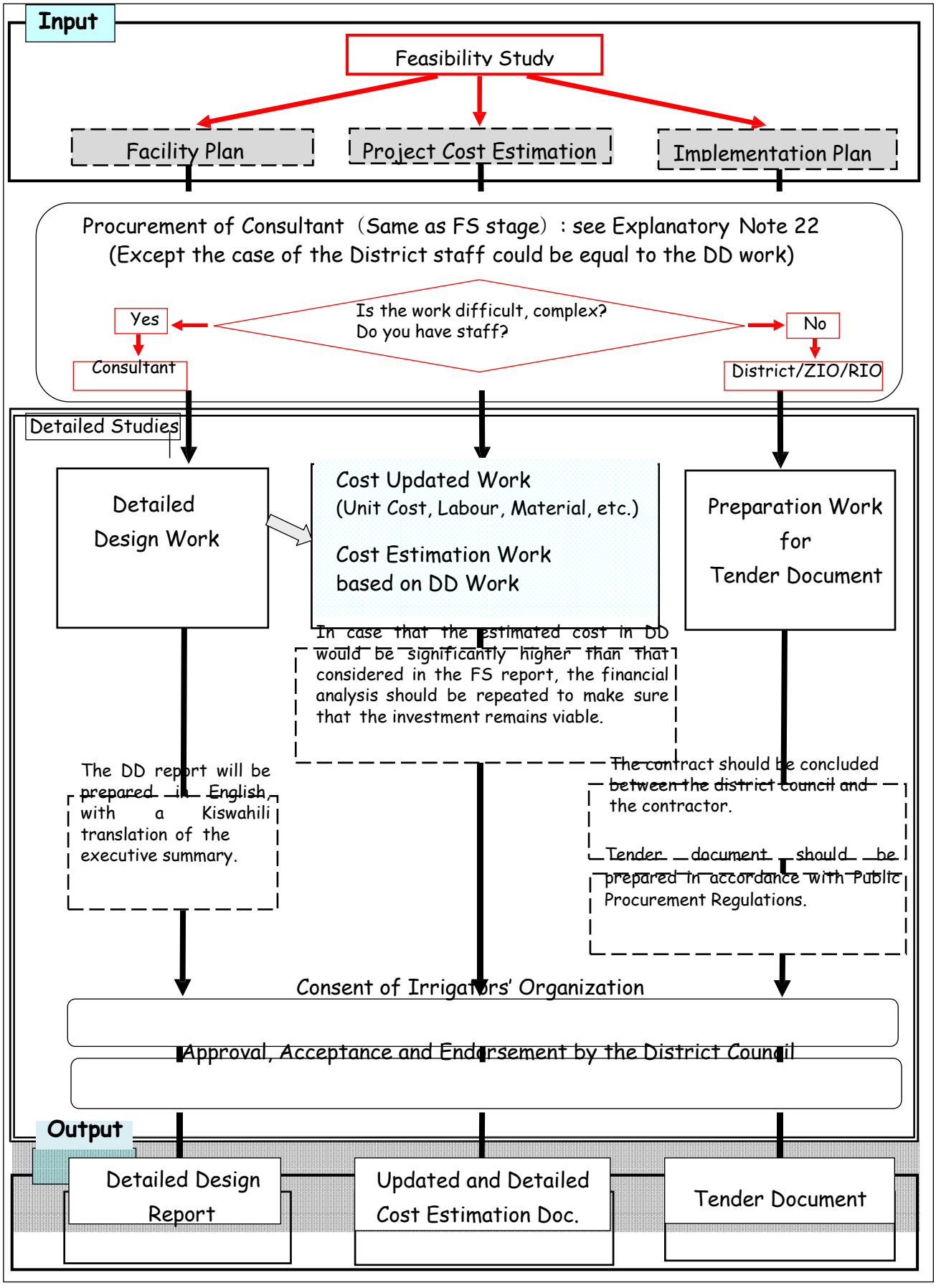
Explanatory Note 16. Diagram Project Implementation Agreement between PC, DED and ZIE



Explanatory Note 17. Diagram of ISD/DADP



Explanatory Note 18.Flow of Preparation of DD and Tender Document



Explanatory Note 19. Contents of Detailed Design Report (General type)

Chapter 1. Outline of Irrigation Scheme formulated by Guidelines
- 1-1 Background of the Irrigation Scheme
- 1-2 Implementation Policy of the Irrigation Scheme
- 1-3 Environmental review

Chapter 2. Detailed Design
- 2-1 Preliminary Design Dimensions
- 2-2 Hydraulic Design (including preparation of water distribution diagram)
- 2-3 Structure Design
- 2-4 Drawings
- 2-5 Calculation of Material / Bill of Quantities
- 2-6 Cost Estimation

Chapter 3. Work Plan
- 3-1 Work Plan
- 3-2 Implementation Schedule
- 3-3 Operation & Maintenance Plan

Chapter 4. Project Cost
- 4-1 Operation & Maintenance Cost
- 4-2 Total Project Cost

Chapter 5. Project Evaluation

Chapter6. Tender Document
- 6-1 Document for Consultant Procurement
- 6-2 Document for Contractor Procurement

As for the estimation work, it needs to take account of the following three items.

- Cost estimate shall be made from quantity and current unit rate.
- Pre former quotation of major material shall be taken from 3 companies at least.
- Unit rate of construction shall be made based on cost of material, manpower, transportation etc.

Measuring scales shall be shown in the drawings to be installed at important facilities such as intake, main canal and turnout for the measurement of water depth so as to know the discharges through facilities for the operation of such facilities.

The water distribution diagram shall be prepared at the DD stage. In case there is any change in the water distribution diagram during the implementation stage, it shall be modified during O&M stage in accordance with the actual condition in the field. A sample of flow distribution diagram is shown in Appendix 7-4. As the sample, Activities in DD Stage for Main System are shown in Technical Guidance (**Explanatory Note 20**.)

Explanatory Note 20. Activities in DD Stage for Main System as a Reference

Field	Activities to be studied
Location Topography	- Canal alignment survey (strip-survey) and survey of appurtenant structures
Soils Agriculture	- Final cropping pattern
Hydrology, Water	- Final computation for design
Geotechnical Aspects	- Detailed geotechnical investigations with drilling as necessary at head works, canals, structures, borrow areas, quarries - Recommended geotechnical design parameters - Final computations for design report
Engineering Design	- Hydraulic model test if needed - Review and modification of preliminary design into final design - Preparationofwaterdistributiondiagram（seeAppendix7-4） - Detailed design, construction drawings, Bill of Quantities and Tender Documents - Design Report - Construction cost and methods
Multi-Sector Aspects	- Liaising with agencies on related aspects: roads; transmigration; agriculture; local government
End Products	- Design Report - All basic information and data - Design calculations - Construction drawings - Bill of Quantities - Cost estimate - Construction method and implementation programme - Tender Documents - O & M Manual （see Appendix 7-2）
Conclusion Recommend	- Prepare for construction - Collect additional data needed for construction - Facilitate land acquisition
Level of Accuracy	- Engineering 90% - Cost 90%

Source: Chapter 1, IRRIGATION DESIGN MANUAL Vol. 1of 2 (MOAC)

Explanatory Note 21. Composition of Tender Document

Tender Document will be prepared in accordance with following regulations.

- Public Procurement (Procurement of Goods and Works) Regulations
- Public Procurement (Procurement of Consultants) Regulations
- The Local Authority Procurement Regulations
- The Local Government Procurement Manual
- Standard Tendering Document / Procurement of Works (Smaller Works Contract) issued by National Competitive Tendering Committee

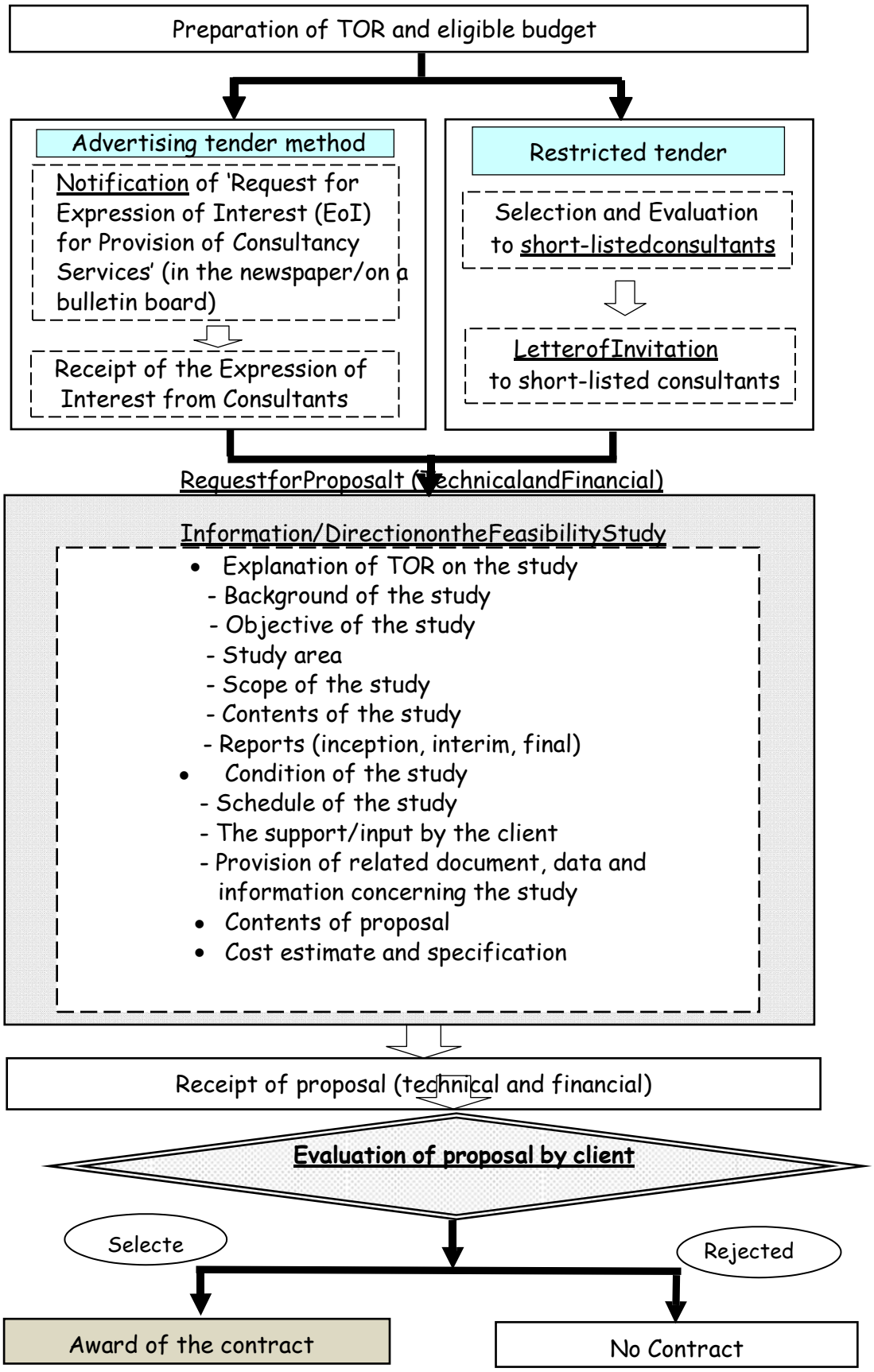
Tender Document of General Type is composed as below.

(1) Tendering Schedule
(2) Invitation to tender
(3) Tender documents

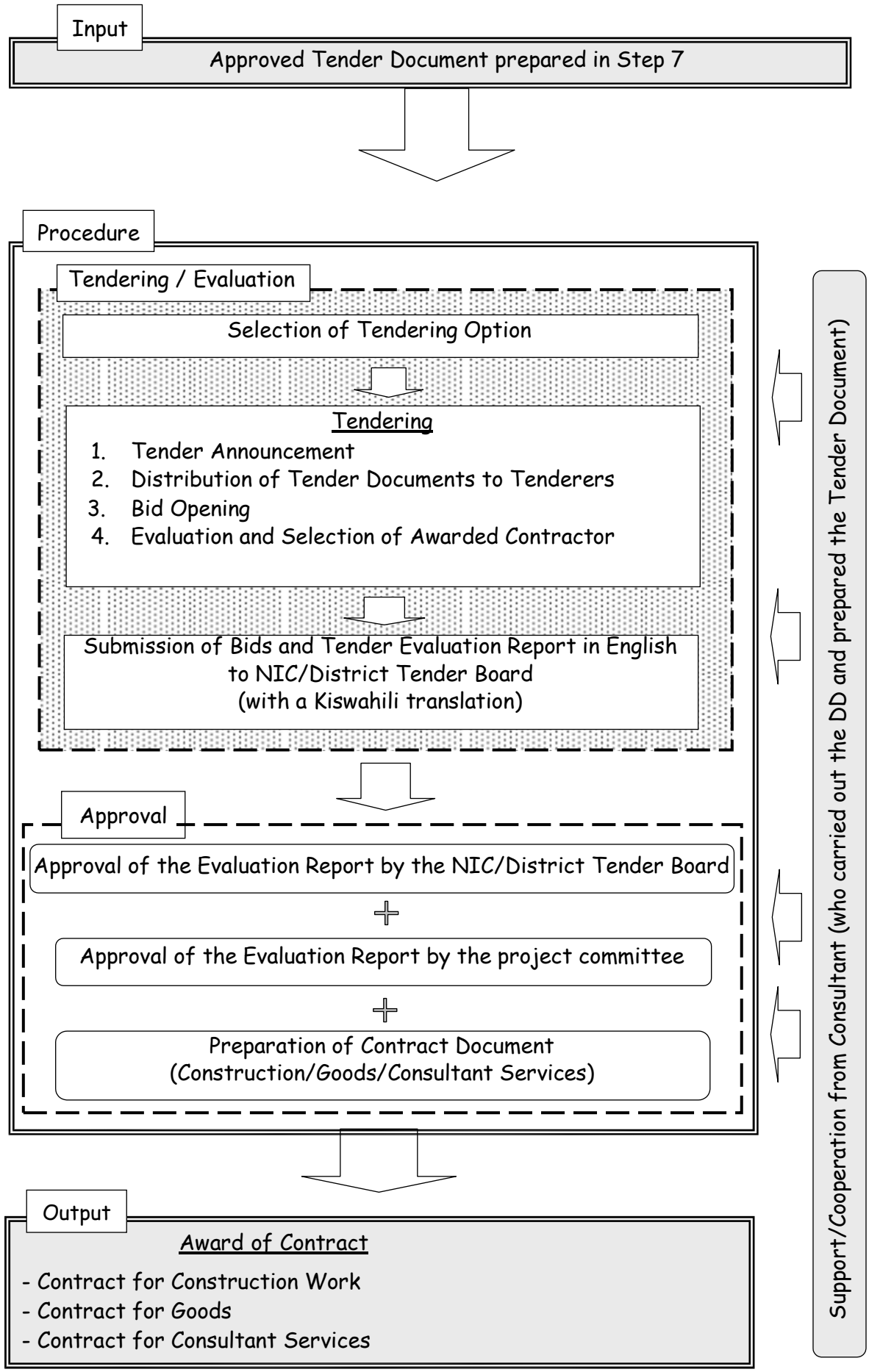
Section1.	Instruction to tenderers
Section2.	Form of contract
Section3.	Particular conditions of contract
Section4.	General condition of contract
Section5.	Construction schedule
Section6.	Form of tender
Section7.	Technical specification
Section8.	Drawings

For details regarding tender documents, read the 'Standard Tender Document (Central Tender Board, Ministry of Finance).
Sample documents of TORs for DD works are shown in Appendix 7-3.

Explanatory Note 22.Procedure of Procurement of Consultants at the DD Stage



Explanatory Note 23. Diagram of Tendering to Contract Award

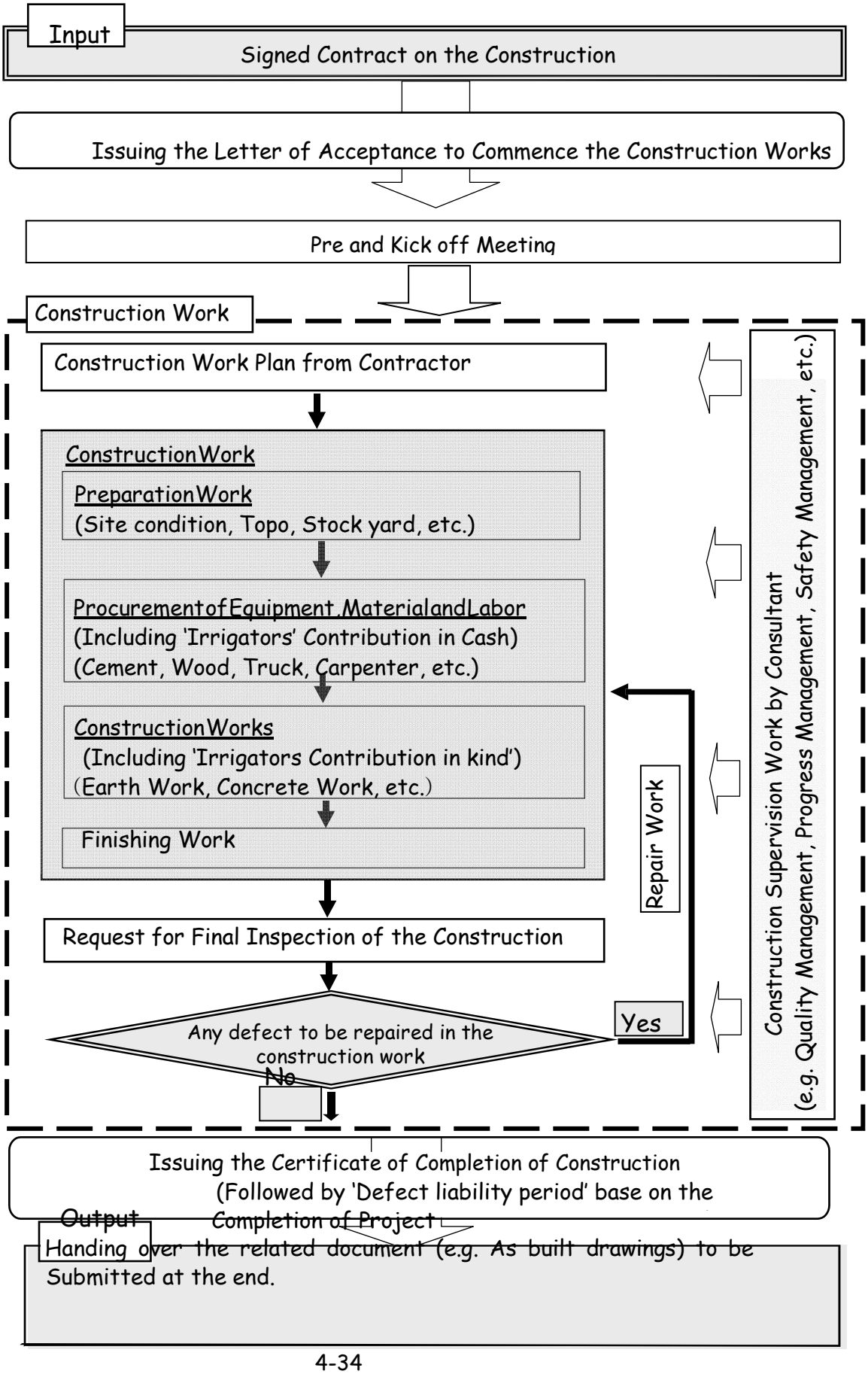


Explanatory Note 24. Processes of Tendering and Party in charge of each Process

No.	Processes of Tendering	Party in charge of every Process				
		District Council	Council Tender Board	The project comittee	Consul-Tant	Contrac-tor
1	Tender announcement Background of the project Scope of work Conditions of prequalification Notification to applicants	O	OO	+	O	
2	Distribution of tender document to tenderer who expressed interest for the Tender Invitation to tender Tendering schedule Tender documents	OO		+	O	O
3	Bid opening	OO		+	O	O
4	Tender evaluation Bid (Contract Amount) Construction/procurement Schedule Other documents to be submitted as attachment of Bid document	O	OO	+	O	
5	Award of contract	OO	O	+	O	OO

Remarks) OO: Main Party Responsible, O: Sub Party Responsible, +: Party who has the Right to participate Item

Explanatory Note 25. Flow of the Implementation of the Construction



Explanatory Note 26: Sample of construction schedule

Name of Scheme:

Construction Schedule (Sample)

Construction Item	Quantity	Plan	20xx Aug.	Sep.	Oct.	Nov.	Dec.	20xx Jan.	Feb.	Mar.	Remaks
Contracted Date			★ Date								
Preparation Work	Lump sum	Plan									
		Actual									
Head work	nos.	Plan									
		Actual									
Canal	xx km	Plan									
		Actual									
Drop	xx nos.	Plan									
		Actual									
Road Crossing	xx nos.	Plan									
		Actual									
Aqueduct	xx nos.	Plan									
		Actual									
Chute	xx km	Plan									
		Actual									
Division Box	xx nos.	Plan									
		Actual									
Off take	xx nos.	Plan									
		Actual									
Finishing Work	Lump sum	Plan									
		Actual									

: Plan

: Actual

Explanatory Note 27. Points to keep in mind regarding irrigators' contribution

The Irrigators' Organization should monitor the status of cash contributions if the funds are held in a deposit account, provided the entity is organized under a legal framework that demands audited accounts.

Measurement and monitoring contributions made in kind is less easy. However, stockpiles of naturally occurring materials can be measured by the farmers' organization jointly with district staff. Quantities should be registered against the individual members or groups of members concerned, moneyed out at the going market rate. The provision of unskilled labour can be treated in a similar manner: the excavation of canals and drains, for example, can be dealt with on a piecework basis, measured by the farmers jointly with district staff and quantities registered against the individuals or groups concerned, converted to money terms at the going contractors' rate.

There will be a natural tendency for over-measurement of in-kind contributions, on the part of both the farmers' organization and district staff. This should be mitigated by ensuring that the detailed designs, drawings and documents make it absolutely clear which physical works are to be farmer-built, so that completion and compliance can be easily verified from quantities and site inspections. The supply of naturally occurring materials should also be specified clearly in the contract, with the contractor being required to issue a receipt for quantities received. However, monitoring is essential to ensure that the correct approach is adopted in the detailed designs and tender documents. Otherwise it will not be easy to realize any contribution.

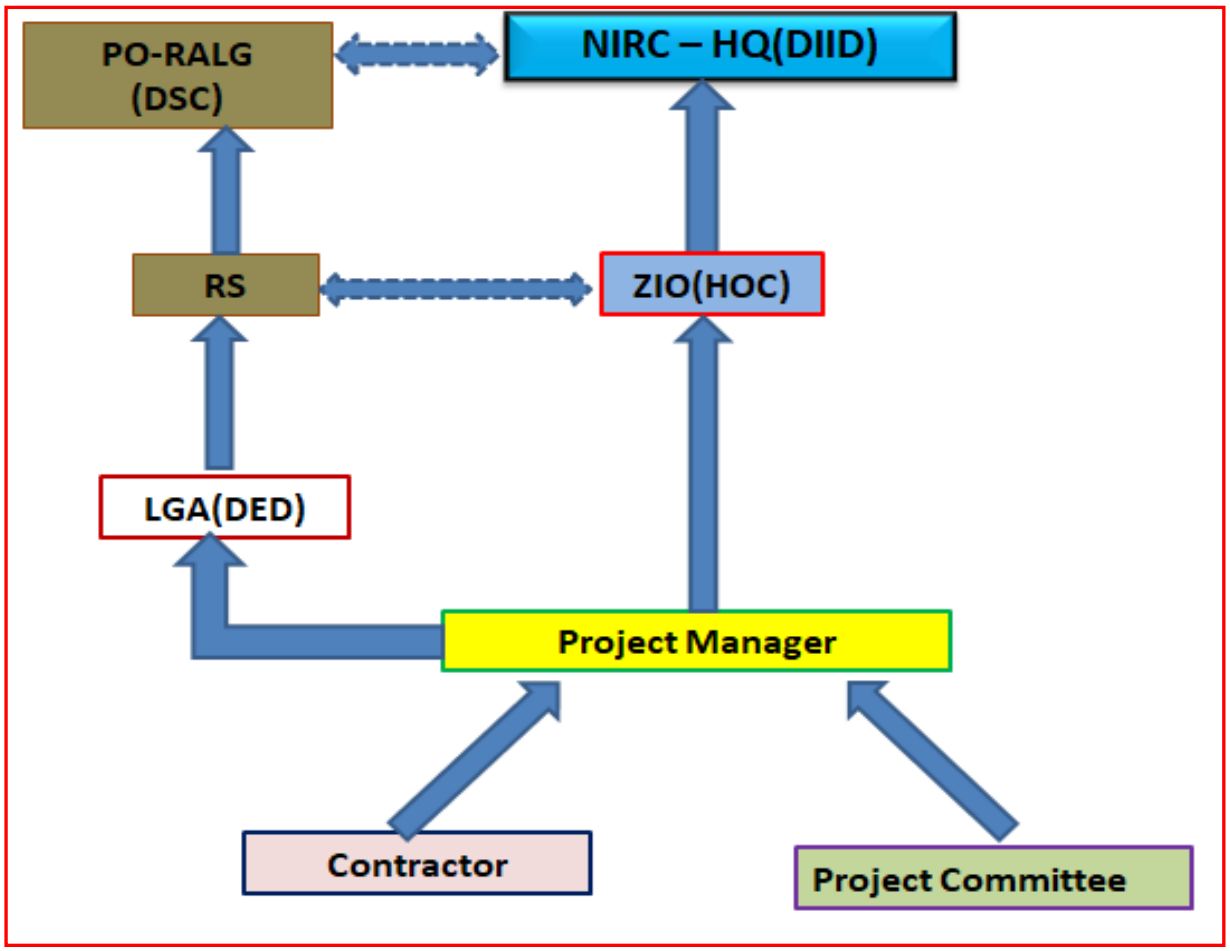
(Source: Guidelines for Participatory Improvement to Farmer Initiated and Managed Smallholder Irrigation Schemes)

Explanatory Note 28. Flow of reporting system

This explanatory note is specific for construction supervision management. At first stage the Contractor prepares the Monthly Report and measurement sheets and submits to the Project Manager. Based on the contractor and Project committee reports the PM prepare the Monthly Progress Report and submit to Head of Construction (HOC) at ZIO and LGA's.

The ZIO compile the Report and send to the Director of Irrigation Infrastructure Development (DIID) -NIRC.

However the LGA's submit the reports to the RS which can be shared between RS and ZIO as indicated in the diagram below. Furthermore this report can be shared between NIRC-HQ and PO-RALG.



Section 4-2 Flow Chart and Check List

Step 1 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Organization of DIDT	❑ Nominating members		
↓ Endorsement of DIDT	❑ Original proposal by WAEO ❑ Official assignment by HDI	❑ Form-1b Member list of DIDT	
↓ Arrangements of kick-off meeting	❑ Arrangements of meeting		
↓ Preparation of material / stationery	❑ Preparation of material / stationery	❑ Explanatory material / stationery	
↓ Kick-off meeting	❑ Explanation of scheme selection ❑ Explanation of steps ❑ Explanation of community's role ❑ Explanation of schedule		
↓ Preparation of memo on workshop result	❑ Preparation of memo	❑ Form-2: Memo on meeting result ❑ Participants' list ❑ Minutes	

<< References >>

1. Guidelines for District Agricultural Development Planning and Implementation, November 2006.
2. Guidelines for Participatory Improvement to Farmer Initiated and Managed Smallholder Irrigation Schemes, July 2003.

Step 1s : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Formation of project committee	❑ Briefing by **DIDT** ❑ Election of committee members	❑ Project committee member list	
Understanding of association / cooperative	❑ Briefing by **DIDT**		
Decision of structure of the legal entity	❑ Discussion among beneficiaries ❑ Decision		
Establishment of the IO interim committee	❑ Election of interim committee members	❑ IO interim committee member list	
Preparation of constitution / by-law	❑ Preparation of constitution / by-law	❑ Constitution / by-law of the IO	
Preparation of the IO member list	❑ Preparation of the IO member list	❑ IO member list	
Election of IO Committee Application for registration Application for water use permit	❑ Obtaining application form ❑ Briefing by **DIDT** ❑ Filling out of application form ❑ Submission of application form	Application form for registration	Certificate for registration
	❑ Election of the IO Committee	❑ Committee member list	
	❑ Obtaining application form ❑ Briefing by **DIDT** ❑ Filling out of application form ❑ Submission of application form	❑ Application form for water use permit	

<< References >>

1. Guidelines for District Agricultural Development Planning and Implementation, November 2006.
2. Guidelines for Participatory Improvement to Farmer Initiated and Managed Smallholder Irrigation Schemes, July 2003.
3. Guidelines for Irrigation Scheme Formulation for District Agricultural Development Plan, November 2007.
4. Participatory Agricultural and Empowerment Project (PADEP) Guidelines for Preparation and Implementation of Community Agricultural Development Subprojects, April 2003.

Step 2 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Arrangements of first planning workshop	❑ Arrangements of workshop		
↓ Review of outputs of O&OD and formulation	❑ Review of opportunities, obstacles and causes ❑ Review of interventions, steps of implementation, inputs and cost ❑ Defining steps of implementation		
↓ Discussion on plan of actions	❑ Discussion on actions plan	❑ Form-3: action Plan ❑ Participants list	

<< References >>

1. Guidelines for District Agricultural Development Planning and Implementation, November 2006.
2. Guidelines for Participatory Improvement to Farmer Initiated and Managed Smallholder Irrigation Schemes, July 2003.
3. Guidelines for Irrigation Scheme Formulation for District Agricultural Development Plan, November 2007.

Step 3 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Arrangements for second planning workshop	❑ Arrangements for workshop		
↓			
Identification of SWOT	❑ Discussion on SWOT	❑ List of SWOT	
↓			
Identification of measures, solutions and strategies	❑ Discussion on measures, solutions and strategies	❑ Form-5: Proposed measures, solutions and strategies ❑ Participants' list	

<< References >>

1. Guidelines for District Agricultural Development Planning and Implementation, November 2006.
2. Guidelines for Participatory Improvement to Farmer Initiated and Managed Smallholder Irrigation Schemes, July 2003.

Step 4 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be
Writing Commitment Letter	❑ Explanation ❑ Instruction on writing and signing the Commitment	❑ Form-5: Form of Commitment letter	❑ Reply from DED

<< References >>

1. Guidelines for District Agricultural Development Planning and Implementation, November 2006.
2. Guidelines for Participatory Improvement to Farmer Initiated and Managed Smallholder Irrigation Schemes, July 2003.

Step 5 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Preparation of Feasibility Study (FS)	❑ Contents of TOR	❑ TOR for FS	❑
↓ Agreement with selected party to implement FS	❑	❑	❑ Signed agreement with selected party
↓ Procurement of Consultants (if need arises)	❑ Confirmation Procurement of Consultant	❑	❑ Signed contract with consultant
↓ Approach and Application of Participatory Design Approach	❑ Participation to FS by Irrigators' Organization	❑	❑
↓ Major Requirement to be studied in-depth in FS	❑	❑	❑
↓ Presentation of Feasibility Study Report	❑ Contents of FS Report	❑ EIA Registration Form	❑ Feasibility Report Result of EIA
↓ Endorsement of Feasibility Study Report by Irrigators' Organization (IO)	❑	❑ Endorsement Letter for the FS report from The Irrigators' Organization	❑

《Reference》

1. GUIDELINES FOR PARTICIPATORY IMPROVEMENT TO FARMER INITIATED AND MANAGED SMALLHOLDER IRRIGATION SCHEME: DITS
2. Planning Manual : Section XI The Feasibility Report
3. Irrigation Manual (FAO) : Chapter 6 Principles and guidelines on the preparation of feasibility studies for irrigation project (Vol.1)
4. Selection and Employment of Consultants: Central Tender Board/Ministry of Finance
5. Standard Request for Proposal: Central Tender Board /Ministry of Finance
6. THE ENVIRONMENTAL IMPACT ASSESSMENT AND AUDIT REGULATONS, 2005

Step 6: Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Explanation of FS and EIA results of FS from the District Council	❑	❑ Recommended Plan in FS Report Result of EIA	❑
Obtain approval for the result of FS from the	❑	❑	❑ Appraisal for the FS by the HDI
Obtain approval for the results of FS from the	❑	❑	❑ Approval for the FS by the District Council
Preparation of Project Implementation Agreement	❑	❑Draft Project Implementation Agreement	❑
Signature of Project Implementation Agreement	❑	❑	❑Singed Project Implementation Agreement
	❑	❑	❑

《Reference》

1. GUITDELINES FOR PARTICIPATORY IMPROVEMENT TO FARMER INITIATED AND MANAGED SMALLHOLDER IRRIGATION SCHEMES
2. Annex 1 (Local Agricultural Investment) of Guidelines for District Agricultural Development Planning and Implementation (ASDP)

Step 7 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Preparation of detailed designs, tender documents and Updated Cost Estimation Document	❑ DD report and Tender Document	❑	❑
↓ **Procurement of consultants (if necessary)**	❑ Procurement of consultants	❑	❑ Advertising for procurement of consultants
↓ **Receiving and Approval of the above three Documents by District Council**	❑	❑	❑ Detailed Design Report, Updated Cost estimated Doc. , Tender Doc.
↓ **Approval, Acceptance and Endorsements by irrigators' organization**	❑	❑ Approval Letter from Irrigators' Organization	❑
	❑	❑	❑

《Reference》

1. Irrigation Design Manual (MOAC)
2. The Local Authority Procurement Regulations
3. The Local Government Procurement Manual
4. Selection and Employment of Consultants / Central Tender Board, Ministry of Finance
5. Standard Request for Proposal / Central Tender Board, Ministry of Finance
6. Standard Tendering Document / Procurement of Works / National Competitive Tendering (Smaller Works Contract): Central Tender Board, Ministry of Finance, 2002
7. The Public Procurement (Goods, Works, Non-Consultant Services and Disposal of Public Assets by Tender) Regulations, 2005
8. Tender Evaluation Guidelines / Procurement of Goods or Works: Central Tender Board, Ministry of Finance, Jun. 2002
9. Tender Evaluation Guidelines / Procurement of Works or Goods: Public Procurement Regulatory Authority, Feb. 2007

Step 8 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Understanding and Cooperation by Consultant	❑ Request to Consultants to collaborate tender procedure	❑	❑
Selection of Tendering Option	❑	❑	❑
Preparation of Tender	❑ Preparation of tender schedule	❑	❑
Notification to Applicants and Deliver the Tender Document	❑ Issuing the tender announcement	❑ Tender Document to tenderer	❑ Receipt of Expressed interest to bid from tenderer
Receiving Bid Document and Bid Opening	❑ Conduct of Bidding Ceremony	❑	❑ Bid Document
Tender evaluation	❑ Check and Evaluation of submitted Bid Documents	❑	❑ Tender Evaluation Report
Approvals by district tender board and irrigators' entitv/award	❑ Preparation of Contract Document	❑ Appraisal of Tender Evaluation Report	❑ Signed Contract Document

<<Reference>>

1. Public Procurement (Procurement of Goods and Works) Regulations
2. Public Procurement (Procurement of Consultants) Regulations
3. Tender Evaluation Guidelines / Procurement of Works or Goods (PPRA)

Step 9 : Detailed Flow Chart and Check List

Work flow	Check List of Work Items	Paper/Report to be prepared/submitted	Result/Report to be obtained/received
Issuing the Letter of Acceptance on commencement of	❑	❑ Letter of Acceptance on commencement of Works	❑
Submission of Construction Work Plan and other necessary documents at beginning	❑ Checking documents submitted by the contractor	❑	❑ Construction Plan from the contractor
Supply of goods & services by contractors	❑ Execution of irrigators' contribution	❑	
Construction by contractors & supervision by consultant (if necessary)	❑ Collaboration to construction supervision	❑	
Final inspection of the construction work and issuing of the Certificate of completion of the Project	❑ Conducting Final inspection	❑ Certificate of Completion of the Work	Request Letter on final inspection of the works
Next Stage Stage 5: Operation & Maintenance (Practice and monitoring	❑ Preparation of O & M Stage	❑	

《Reference》

1. Guidelines for Participatory Improvement to Farmer Initiated and Managed Smallholder Irrigation Schemes
2. Text book or Manual on Construction Supervision

SECTION 5 GENERAL INFORMATION

Implementation Framework after Formulation Stage

1) General

Irrigation schemes drawn up based on the ISD planning procedure and the Formulation Guidelines will proceed to the implementation stage after securing sources of fund. In order to realize the irrigation scheme development, Implementation Guidelines show the processes from preparation to completion of construction, and start of the O&M stage.

Needless to say, these processes shall be implemented under the ISD project implementation framework. The implementation framework for irrigation scheme development in accordance with the ISD guidelines is described below.

2) Institutional Arrangements

Below is the institutional framework for irrigation scheme development, described in accordance with the ISD guidelines:

1) The Village level

a. Planning and Finance Committee (PFC)

The Planning and Finance Committee (PFC), a legal arm of the Village Council responsible for agricultural matters, will supervise the project activities.

b. Project Committee

Once the project is approved by the full Council as part of ISD, and then it is decided that the project should be contained in the action plan of the district in a financial year, the beneficiaries of irrigation scheme development will select project committee members from among themselves. The Project Committee will deal with day-to-day projects. The meeting for selecting project committee members shall be:

- chaired by Chairperson of the Village Government,
- facilitated by the Village Executive Officer, and
- Attended by at least 70% of the beneficiaries.

The Project Committee shall be constituted by not more than 10 members of whom at least 40% shall be women. The Project Committee shall elect a chairperson, a secretary, a treasurer and signatories. It is advised that women also should be

among the signatories. The Project Committee will be accountable to the village authority. In turn, the village government will provide the needed support for the Project Committee to ensure smooth preparation and implementation of project activities.

The roles of the Project Committee will be to:

- Supervise the project implementation,
- Maintain a bank account into which the agricultural grants will be deposited under supervision and guidance of the Village Council,
- Provide the community with information on the progress of project implementation,
- Mobilize contributions from community members, group members, NGOs, CBOs and any other development agencies,
- Handle the procurement of goods and services as well as the management of agricultural investment grant,
- seek technical support and other services from agricultural extension workers, NGOs and other development agencies, and
- prepare and submit monthly, quarterly and annual physical and financial reports to the Village Council in accordance with the existing PMO-RALG reporting system.

2) Ward and district levels

a) **The District Facilitation Team (DFT)**

The District Executive Director (DED) shall establish an interdisciplinary District Facilitation Team (DFT). The members of DFT shall include:

- Head of Department dealing with Irrigation (HDI)
- District Irrigation Engineer
- Irrigation Technician
- District Extension Officer
- District Crops Officer
- District Livestock Officer
- District Planning Officer (DPLO)
- District Water Engineer
- Community Development Officer
- Cooperative Officer
- District Environmental Management Officer (DEMO)
- Representatives of private sector, NGOs and research stations

The DFT will be a technical group working under the Council Director. The District Planning Officer (DPLO) will lead the DFT.

At the project implementation stage, the roles of the DFT will be to:

- facilitate the participatory process, support the development of the project, and strengthen the communities,
- provide technical support during implementation, monitoring and evaluation of the project, and
- based on the VADPs, carry out needs assessment to identify the required support services and capacity building needs at the village, ward and district levels.

b) **The District Irrigation Development Team (DIDT)**

The District Irrigation Development Team (DIDT), shall focus on the irrigation scheme development in the district.

The composition of the DIDT members will be decided by the DFT. The DIDT should be composed of:

- Head of Department dealing with Irrigation (HDI) as chairperson
- District Water Engineer
- District Irrigation Engineer
- Irrigation Technician
- DSMS for Crops or Crops officer
- Community Development Officer
- District, Ward and Village Extension Officers
- Other relevant staff of the district office and other relevant offices (RAS, WBO, etc.)

At the project implementation stage, the roles of the DIDT will be to:

- train on participatory planning and implementation processes, group formation and dynamics, procurement of goods and services, contracting, financial management, environmentalmanagement, and participatory monitoring and evaluation,
- provide technical support during formulation, planning, implementation,monitoring and evaluation of the irrigation scheme development projects, and
- carry out needs assessment to identify the required support services and capacity building needs, relating to irrigation scheme development and development of irrigated agriculture and marketing, at village, ward and district levels.

3) The ZIO/RIO

The ZIO/RIO will provide technical assistance in the processes of implementing the irrigation scheme development, upon request from the district.

A ZIO/RIO staff member can be an assisting member of the DIDT upon request from the district to assist in the project activities. In this case, the DED officially requests the ZIE for assistance. Also, the ZIO/RIO staff member's activities shall be covered by the respective district.

In case the district entrusts the work of survey, feasibility study, designing, construction supervision to ZIO/RIO, a simple contract agreement is needed. The contract agreement shall be made between the ZIE and the DED with clear Terms of Reference (TOR) and with the appropriate contract price estimated on clear bases. This contract shall be covered by District fund.

4) The Regional Secretariat

The Regional Secretariat will have the following roles:

- To undertake regular monitoring visits to review the quality of supported investments and services,
- To provide technical advice for the district staffs,
- To coordinate and harmonize development activities in the region, and
- To be coordinator between the PO-RALG and districts.

3) The Framework for Activities and Persons/Institutions Involved

1. **Outline of activities**

   The outline of activities is shown in Table-A.

2. **Roles of Persons/Institutions involved in charge of each step**

   The roles of persons/institutions involved in charge of each step are shown in Table-B.

3. **Time Frame of steps**

   The time frame of steps is shown in Table-C.

Table-A Outline of activities

Step	Why?	How?	Who？	Result
Step-1 Scheme awareness campaign	At the start of the implementation stage, the community will understand how they proceed with project activities.	DIDT holds a kick-off meeting with the community.	Facilitator: DIDT Participants: irrigators, non-irrigators, neighbouring communities	All stakeholders understand how to proceed with project activities.
Step-1s Community's institutional setup	At the start of the implementation stage, a project committee shall be formed, and the irrigators' organization shall be registered as a legal entity.	DIDT facilitates the formation of the project committee and the irrigators' organization, is registered as a legal entity. Application of water right.	Facilitator: DIDT Participants: irrigators	Legal standing of irrigators' organization for implementation and O&M is secured.
Step-2: Participatory action planning (PAP)	All stakeholders shall be given an Opportunity to discuss and make a joint plan of action.	Utilizing outputs of O&OD and formulation of activities, DIDT facilitates action planning of steps, roles of participants, time frame, budget, etc.	Facilitator: DIDT Participants: irrigators, non-irrigators, neighbouring communities	How each stakeholder contributes to each step is planned.
Step-3: Participatory diagnostic study (PDS)	Understanding and in-depth thinking of current situations makes project responsive to real opportunities and Constraints.	DIDT facilitates discussion on strengths, weaknesses, opportunities and threats, then leads discussion on strategies to deal with SWOT.	Facilitator: DIDT Participants: irrigators, non-irrigators, neighbouring communities	Participants understand current situations, and baseline data for F/S are provided.
Step-4: Commitment Letter	The commitment of irrigators shall be Confirmed in writing.	DIDT facilitates community's writing the letter and signing it.	Facilitator: DIDT Participants: irrigators	Irrigators' and district's obligations are confirmed.

Step-5: Feasibility study/Participatory design	Participatory design to promote ownership and commitment, to provide basis for feasibility study, which in turn will provide basis for subsequent investment decision; need to screen for harmful environmental Impacts.	Joint studies between the scheme members, other stakeholders and specialists; submission of results to irrigators' entity for approval/veto.	Irrigators; other stakeholders; consultants; DIDT; ZIO/RIO	Feasibility Report fully endorsed by irrigators and other stakeholders proving; - critical analysis solutions; - description of the preferred solution; -environmental scoping; - timeframe for implementation; - proposals of management; - proposals for O& M - proposals for M & E; - proposed irrigators' contribution
Step-6: Project Implementation Agreement	So that finance from project as defined by Feasibility Report can be allocated.	Consideration and acceptance of positive Feasibility Report by Irrigators' Organization; preparing and signing agreements.	District council and Irrigators' Organization.	Signed agreements between District council and Irrigators' Organization
Step-7: Detailed design and Tender Documentation	To permit tendering for the goods, services or works to be supplied/constructed.	Detailed project design studies.	Generally by consultants, or, in the case of small contracts within its capacity by the district (with or without ZIO backstopping), together with irrigators.	Detailed design report and tender documents, together with updated cost estimate, approved.
Step-8: Tendering and Contract Award	To permit competitive bids to be received and evaluated, and permit arrangements made to proceed with implementation.	Following the Local Government (Selection and Employment of Consultants) Regulations or Local Government (Procurement of Goods and Works) Regulations as appropriate.	Consultants; district council; irrigators' entity.	Award of contract(s) for project implementation, approved irrigators' entity.

Step	Why?	How?	Who？	Result
Step-9: Construction	Key activity in the achievement of project objectives.	Joint effort between the various actors involved including/especially the irrigators' entity.	Irrigators, consultants, contractors, suppliers and the district council.	Project completion.
Operation and maintenance	To aim at sustainable, profitable use of the investment. Effective and efficient water use by organized water management is needed.	At the start of the O&M stage, the basic O&M system is established. O&M plan is made at the start of each season or each year, and O&M activities are practiced and monitored.	Leading player: Irrigators Facilitator: DIDT, as required	Constructed irrigation facilities are operated and maintained properly, aiming at sustained and profitable utilization of investment.

Table-B. Roles of Persons/Institutions Involved in Charge of each Step

Major Activities	Persons/institutions involved		
	NIRC	Regional Secretariat	ZIO/RIO
Step-1 : Scheme Awareness Campaign			***O***
- Organisation of DIDT - Kick-off meeting			Assistance for DIDT as required
Step-1s : Community's Institutional Setup			***O***
- Formation of project committee - Formation and registration of WUO or IO			Assistance for DIDT as required
Step-2 : Participatory Action Planning (PAP)			***O***
- First planning workshop - Preparation of plan of action and budget			Assistance for DIDT as required
Step-3 : Participatory Diagnostic Study (PDS)			***O***
- Second planning workshop - Understanding of current situations through SWOT			Assistance for DIDT as required
Step-4 : Commitment Letter			***O***
- Writing and signing the letter			Assistance for DIDT as required
Step-5 : Feasibility Study/Participatory design			***O***
- Procurement of consultants (if necessary) - Participatory designs, environmental study, financial analysis, and preparation of feasibility study report - Preparation of community's project proposal			Entrusted as required
Step-6 : Project Implementation Agreement			
- Preparing and signing Project Implementation Agreements			
Step-7 : Detailed Design and Tender Documentation			***O***
- Procurement of consultants (if necessary) - Detailed designing & tender documentation			Entrusted as required
Step-8 : Tendering and Contract Award			
- Tendering and tender evaluation - Tender evaluation and award			
Step-9 : Construction			***O***
- Supply of goods & services by contractors - Construction			Supervision – entrusted as required
Operation and Maintenance			***O***
- Establishment of the O&M system - Planning, practice and monitoring of the O&M			Assistance for DIDT as required

Table-B Roles of Persons/Institutions involved in charge of each step

Persons/institutions involved						
DIDT	District Council	District Tender Board	Tender Evaluation Team	Irrigators' Organisation (IO)	Intended Participants	Private Consultant
O				O	O	
Facilitation				Leading player	Participation in activities	
O				O		
Facilitation				Leading player		
O				O	O	
Facilitation				Leading player	Participation in activities	
O				O	O	
Facilitation				Leading player	Participation in activities	
O				O		
Facilitation				Leading player		
O	O			O		O
Facilitation	Approval & agreement			Leading player		Entrusted as required
O	O			O		
Facilitation	Approval & agreement			Leading player		
O	O	O		O		O
Facilitation	Approval	Approval		Leading player		Entrusted as required
O	O	O	O	O		
Facilitation	Approval	Leading role or support	Leading role	Leading player		
O	O			O		O
Facilitation	Approval			Leading player		Supervision – entrusted as required
O	O			O		
Facilitation as required	Approval			Leading player		

Table-C. Time Frame of steps

Major Activities	Duration	Schedule
Implementation of Irrigation Scheme Development		
Step-1 : Scheme Awareness Campaign		
- Organization of DIDT - Kick-off meeting		
Step-1s : Community's Institutional Setup		
- Formation of project committee - Formation and registration of IO		
Step-2 : Participatory Action Planning (PAP)		
- First planning workshop - Preparation of plan of action and budget		
Step-3 : Participatory Diagnostic Study (PDS)		
- Second planning workshop - Understanding of current situations through SWOT		
Step-4 : Commitment Letter		
- Writing and signing letter		
Step-5 : Feasibility Study/Participatory design		
- Procurement of consultants (if necessary) - Participatory designs, environmental study, financial analysis, and preparation of feasibility study report - Preparation of community's project proposal		
Step-6 : Project Implementation Agreement		
- Preparing and signing Project Implementation Agreements		
Step-7 : Detailed Design and Tender Documentation		
- Procurement of consultants (if necessary) - Detailed designing & tender documentation		
Step-8 : Tendering and Contract Award		
- Tendering - Tender evaluation and contract award		
Step-9 : Construction		
- Supply of goods & services by contractors - Construction		
Operation and Maintenance		
- Establishment of the O&M system - Planning, practice and monitoring of the O&M		

Appendix for Implementation Guidelines

Chapter 6

Principles and guidelines on the preparation of feasibility studies for irrigation projects

Feasibility studies provide the means for assessing developmental options for investment, in this case investment in irrigation. A feasibility study for irrigation development would assess the physical aspects of land, water and climate, and evaluate crop production potential and cropping programmes within the context of the physical aspects. The same study reviews and assesses alternative engineering options in terms of benefits and costs, operation and maintenance, compatibility with the available land and water resources, their impact on the environment, the health of the users and the social life and welfare of the irrigators. Finally, market potentials and access to markets are critically reviewed through such studies and the financial and economic aspects of the development are evaluated. In summary, the feasibility study is expected to provide options for the client with recommendations for the best option combining technical feasibility, financial and economical viability and social desirability and environmental sustainability.

For irrigation projects, the feasibility study is expected to cover the following areas:

1. Climate and natural resources
2. Agriculture
3. Credit and marketing
4. Engineering aspects of the project
5. Social aspects of the project
6. Organization and management aspects of the project 7. Health and environmental aspects of the project 8. Economic and financial analysis

In the previous chapters the multifaceted process of irrigation development has been discussed. This chapter briefly outlines the presentation of this process thought the elaboration of a feasibility study.

6.1. Climate and natural resourses

As a rule, climate and the assessment of the potential and availability of natural resources (land and water) are among the first areas to be addressed in the preparation of a feasibility study.

6.1.1. Climate

The most important climatic data are rainfall, maximum and minimum temperatures, maximum and minimum relative humidity, wind and sunshine hours.

Climate is an important factor in crop production. Different crops have different requirements in terms of temperature, humidity and light. Also, occurrence of frost at certain times may exclude a number of crops from the cropping programme. All in all, the analysis of climatic data with respect to crop production is needed before a cropping programme can be prepared.

Accurate estimates of crop water requirements also rely heavily on the availability of accurate meteorological data. Errors of only 20% in crop water requirement estimates can significantly affect the economics of the project, especially in Africa where the water development cost is high. Hence the need for long-term accurate meteorological data, especially long-term rainfall data.

6.1.2. Land

The topography of the land when combined with the soil characteristics will provide the means of assessing the irrigability of the land and select the most suitable areas for irrigation. In this respect, soil and topographic surveys, discussed in detail in Modules 2, provide the means for this assessment.

6.1.3. Water

Long-term data of river flow and water quality are needed to assess the potential of the water resources. In the absence of hydrological data, rainfall records or flows of nearby streams are used for estimates. In the case of groundwater resources, hydrogeological studies are carried out and records from existing wells and test wells are used to establish long-term and short-term yields of the aquifer (Module 2).

Nevertheless, irrespectively of water availability, the right to using the water should be investigated. This is becoming very important with the establishment of water boards, water strategies and policies as well as water legislation in many countries in Africa. Hence, a water right should be obtained from the relevant authorities that permits the use

of the water. Since the use of transboundary water resources is bound by agreements between the states sharing the same river basin as well as international law, the feasibility study should deal with such matters as and when they arise.

Wherever a new scheme is planned, existing established demands for water upstream and downstream should be investigated and taken into consideration. A formal system of water rights might be in operation, or local people may have an agreement by traditional custom over the way in which water for irrigation is allocated. Proposed changes in water demand must be fully discussed with the national authority responsible for regulating abstraction (Field and Collier, 1998).

Water quality and flow rates are very important for the selection of crops to be grown and the irrigation method to be adopted. As such they should be included in the water resources surveys to be undertaken. Of particular importance is the potential siltation of water reservoirs and the need to protect the catchment areas, in order to avoid the rapid decline in the yield of dams.

6.2. Agriculture

As irrigation development aims at agricultural production the engineering works should be designed for this purpose. The objective is not the conveyance of water but the irrigation of crops. Thus the engineering approaches used should be considered as part of a broader system (irrigated crop production) for which the designed scheme will be constructed to serve.

6.2.1. Existing farm practices

The existing agricultural practices are assessed to analyze the without-project situation. Data is gathered from the baseline socio-economic survey. The data is aggregated to reflect the average production cost and gross margins and incorporated in the financial and economic analysis. The same surveys will provide information on the availability of family labour for use under rainfed farming and irrigation in the future, and assess the need for hired labour.

6.2.2. Land tenure

The land tenure for smallholders varies from country to country in Sub-Saharan Africa. In some countries smallholders have the right to use the land, while in others smallholders have title deeds of their land. How one or the other type of land tenure affects the various aspects of the project should be elaborated in the feasibility study.

6.2.3. Proposed agricultural system

Based on the climate and the natural resources potential, crops are selected for consideration and alternative cropping programmes and rotations are developed for discussion with the smallholders. The cultural requirements of each crop and expected yields should be elaborated and the crop water requirements estimated for alternative cropping programmes. Crop budgets for these crops will be prepared and presented later on in the feasibility study, under financial and economic analysis. The marketing potentials of these crops will also be discussed under the relevant chapter of the study.

6.3. Credit and marketing

As a rule, irrigated crop production is a high-input high-output system. Smallholders therefore need to procure seeds, fertilizers and chemicals in order to optimize their production system. However, the poor cash flow from conventional rainfed farming is too low for such an investment. Consequently, the need for credit is great indeed. It is therefore necessary that the study reviews potential options and makes recommendations under the prevailing land tenure in the scheme.

The choice of crops to be grown and the cropping patterns influence the field layout and irrigation method. However, the choice of crops as well as the cropping programmes are influenced by their marketing potentials. Therefore, an assessment of the existing markets and transport system and road infrastructure, as well as their potential for development, should be made. Market prices, transport costs and farm prices must be predicted, as related to the expected increased volume of production. Processing and/or storage facilities should be considered as part of a marketing strategy.

6.4. Engineering aspects

This part of the feasibility study covers the rehabilitation and/or extension of existing irrigation schemes, as well as the development of new schemes. It deals with the water development, the distribution system, the water storage and control structures and measuring devices, the on-farm irrigation works and the drainage. For these and other engineering works preliminary designs are made and cost estimates prepared.

The same chapter of the feasibility study discusses water duties as relate to the water availability, the selection of the on-farm irrigation system and drainage requirements. Engineering aspects are covered in detail in Modules 7, 8 and 9.

6.5. Social aspects

The project's objectives and expectations can not be realized unless farmers' considerations on benefits and costs, feasibility and desirability and their priorities in life match that which the project requires of them. At times, smallholders' priorities differ from the project's priorities. Hence the need to assess the acceptability and desirability of the farmers to participate in the development of the irrigation scheme. The nature of the population must be understood in order to match the rate of development with the absorptive capacity. Elements such as the level of literacy, farming knowledge and skills, past experience with irrigation, gender issues and attitudes to change are among the several parameters to be considered when analyzing the social aspects of the project.

As a rule, irrigation development brings cultural shock to a smallholder community. With monomodal rainfall conditions, smallholders work for a few months in a year under rainfed conditions. In a sense they are under-employed and have ample time to attend to their social aspects of the society. In contrast to this, irrigated crop production requires almost daily attention throughout the year if it is to be profitable. How able the community is to adjust to these and other changes becomes critically important and should be thoroughly discussed with the farmers.

6.6. Organization and management aspects of the project

An analysis of the structures and competence of the agencies or bodies responsible for the organization and management of the project is necessary. A number of problems or difficulties should be expected to arise during the planning, construction and operation of a fairly large project. Hence the need for the presence or establishment of competent agencies to manage the planning and implementation of the project.

6.6.1. The organization of planning and construction

The planning and construction of a smallholder irrigation scheme involves several stakeholders. Rural authorities, traditional leaders, farmers, relevant Department or Ministry at central level, consultants and contractors are the major stakeholders. At times, sub-contractors are also involved with the construction of some parts of the project. Hence the need for a competent agency to coordinate and supervise the work of all involved in the planning and implementation of the project. The same agency, through established procedures, would be responsible for the selection of the contractor and sub-contractors. As a rule, selection of inexperienced contractors on the basis of a cheaper offer does not always cost less. Delays from one contractor can have snowball effect on other contractors, and the on project as a whole.

6.6.2. The organization of operation, maintenance and management

Irrigation development, especially in sub-Saharan Africa, is very costly. It is therefore necessary for this investment to be utilized productively as soon as possible. Thus, provision should be made from the feasibility study stage onwards for the needed trained engineers, agronomists and technicians to be available on time. Equally important is the assessment of the farmers' training needs, which will enable them to make well-informed decisions and to undertake the operation, maintenance and management of the infield part of the system.

6.6.3. Extension services

The training of farmers and the adoption of new farming practices is the mandate of the country's extension services. However, most extension agents in sub-Saharan Africa are not familiar with irrigated crop production. Hence the need to assess the level of extension know-how and provide for the training needs of the extension staff. While the success of achieving the desirable results will greatly depend on the adaptability of farmers, no effort should be spared in developing and implementing the appropriate training for the smallholders. Establishment of on-farm research, demonstrations, farmers' field schools and the provision of advisory services with back up from specialists are some of the means to be considered.

6.7. Health and environmental impact assessment

Very often the health and environmental aspects of irrigation development are not given deserved attention in the feasibility studies. Water-related diseases affect the health of the irrigators and thus the overall performance of the scheme. Measures to reduce such problems through engineering and other solutions should be incorporated in the feasibility study. The impact of irrigation development on the environment is equally important, as it affects the quality of the water resources and thus downstream water users as well as the ecosystem at large. For details the reader is referred to Chapter 4.

6.8. Economic and financial analysis

Economic and financial analyses are carried out in order to appraise a project. The economic analysis provides the

justification for an irrigation development. The financial analysis evaluates the project's capability to repay the investment and the operation costs of the project. In other words, the economic analysis assesses the economic viability of different alternatives and assists with the selection of one. The financial analysis evaluates different financial alternatives with respect to interest rates, repayment schedules and length of the loan period. For more details the reader is referred to Module 11.

6.9. Presentation of the feasibility study

Following is an outline of the content of a feasibility study for smallholder irrigation development:

Chapter 1 : Summary

Chapter 2 : Background

Chapter 3 : Location

Chapter 4 : Land resources

Chapter 5 : Water resources

Chapter 6 : Climate

Chapter 7 : Agriculture

Chapter 8 : Irrigation

Chapter 9 : Social environment

Chapter 10 : Credit and marketing

Chapter 11 : Engineering requirements

Chapter 12 : Health and environmental impact analysis

Chapter 13 : Organization, maintenance and management

Chapter 14 : Capital cost

Chapter 15 : Operation and maintenance cost

Chapter 16 : Economic and financial analysis

Chapter 18 : Conclusions and recommendations

TOPOGRAPHICAL SURVEYS OF XXXXXX SCHEME
AT XXXXX IN XXXXX DISTRICT

To: Mr. XXXXX - Team Leader
Mr. XXXXX
Mr. XXXXX

SUB: TERMS OF REFERENCE (TOR)

The scope of the assignment shall cover carrying out Topographical surveys of XXXXX (XXX ha) Scheme at XXXXX in XXXXX District.

The Survey team shall specifically undertake the following tasks:

1. Carry out spot levelling survey of the Scheme's Irrigation Command Areas at 50 m x 50 m grids. Additional levels should be taken whenever there is remarkable change of slopes / terrain. The surveys should cover the scheme's sub-systems command areas starting from the proposed / existing diversion intake sites.

2. Draw topographical maps of the scheme's command areas to clearly indicate all the existing irrigation and drainage canals including natural depressions (gullies) and the associated structures, if any:

   (i) Contour lines should be drawn at vertical interval of 0.25 m;

   (ii) Indicate footpaths and farm roads including the associated structures e.g. culverts, cross drainage, etc.

3. Establish permanent reference marks (i.e. beacons) at reasonable intervals along the proposed canal routes, scheme's sub-systems boundaries, etc.; indicate their co-ordinates in X, Y, Z. Reference points should be taken from the existing permanent monuments. Beacons should be established at suitable locations to avoid any destruction during construction stage;

4. Draw layout / traverse of the beacons to scale 1:1,000 or as shall be seen appropriate and also prepare Tables showing names of beacons against their corresponding elevations;

5. Carry out detailed site surveys for the intakes at reasonable coverage as shall be directed by the Engineer. The intake surveys should cover river embankments and any important features which may be necessary for the detailed designs. Contour maps at scale of 1:100 or 1:200 should be produced
   covering individual sites. Contour interval should be 0.25 m;

6. Carry out longitudinal profile surveys of the proposed / existing main canal routes (strip / band survey), taking cross sections at 25 m interval or as appropriate especially in areas where there are significant changes in topography, features and alignments;

7. Draw the canal longitudinal profiles at appropriate scale say 1:50 (vertical) by 1:2000 (horizontal) and plot the canal alignments in plan showing the traverse;

8. Pick details and indicate on drawings all important physical features such as depressions; cultivated areas and settlements located in the command areas, gullies/ valleys, etc.

9. Indicate locations of the proposed farm service roads and pick details of sites for the major crossing structures (proposed bridge sites).

Wishing you the best.

Eng. XXXXX
for **ZONAL IRRIGATION ENGINEER**

XXXXXX

App - 6

Consultancy for "Design of a Surface Water Reservoir for Irrigation of XXXXX Small-Holder Irrigation Project in XXXXX District, XXXXX Region of Tanzania"

TERMS OF REFERENCE（TOR）

1 Introduction

1.1 Background

XXXXX Small holder Irrigation project .The XXXXX Small holder Irrigation project is one of the small scale projects to be implemented under the XXXXX. As a background, the potential for irrigation development in Tanzania is estimated to be 828 000 ha based on soil and water availability - that is 2% of the cultivable area. Exact figures about the total water managed area are not known. It is estimated to be somewhere between 120 000 and 200 000 ha (between 14 and 24% of the potential). Most of this is in traditional, small-holder schemes, with size estimates again ranging from 106 000 to 150 000 ha. Medium to large schemes make up the balance, ranging from 20 000 to 50 000 ha. Almost all irrigation water on the mainland is surface water coming from rivers, streams and springs. In only a few cases, storage reservoirs have been constructed. Sprinkler irrigation is used on some large-scale projects, but it is rather expensive. In the semi-arid central lowlands, with annual rainfall below 500 mm, various forms of water harvesting, micro-catchments and other techniques are used to try to control and concentrate rainfall runoff.

Specifically, the Bisarwi Small Scale *Irrigation* Project will be composed of three components namely; water harvesting, crop production and capacity building. The project is estimated to benefit about 24,000 people, whereby 100 of them will be involved in paddy rice production, each designated one acre. The District Subject Matter Specialists in crop/rice production, irrigation and land use planning will provide the technical backup to the beneficiaries. The beneficiaries will manage the project at grass root level coordinated by two farmers who will be trained in rice/crop husbandry, management of irrigation water and environment. The objective of the design is to provide water to the community for domestic purposes, livestock and irrigation of paddy rice. The design should show the embankment size, cost estimates and water troughs for watering animals.

2 Objective of the Consultancy

The main objective of the assignment is to design and supervise the construction of an earth embankment and associated reticulation or amenities for surface water storage and distribution for the irrigation of paddy rice and horticultural crops in XXXXX village,
XXXXX Ward, XXXXX District of Tanzania. The consulting firm shall carry out topographical surveys, geotechnical investigations, design and produce a tender dossier for construction works. The objective of the design is to provide water to the community for domestic purposes, livestock and irrigation of paddy rice.

The consultants should be highly experienced in the design of earth embankments for large reservoirs with experience of not less than ten (10) years, with proven track records in the design of similar projects. It is estimated that the work will require a maximum input of four months effective XXXXX 20XX.

3 Scope of Works

(i) Assessment of irrigation potential in the area by examining both backward and forward linkages at the same time as the land and water resources potential, estimation of the sectoral water demands (livestock, domestic and irrigation) in the area etc.

(ii) **Feasibility study.** Carry out a feasibility study to investigate and recommend a solution to the problem based on technical evaluation of alternatives including an engineers estimate and tender dossier for construction. During this phase, a design of the earth embankment proposed to store water for small holder irrigation will be carried out.

(iii) **Field Investigations**

- ***Hydrological Analysis.*** The Consultant will carry out a hydrological analysis in order to establish the hydrological characteristics and performance of the catchment, determine the catchment yield and design flood, which will be used for hydraulic designs for the reservoir and spillway, and establishment of the design flood, which will enable the establishment of the yield, reservoir capacity and the design of the spillway and associated hydraulic works accurately.

- ***Ground Investigations.*** The Consultant shall carry out tests to investigate the nature of the sub-soils and soil properties relevant to embankment construction for the purpose of retaining water as well as determining the quality and selection of construction materials with respect to dam foundation, earthen embankment and spillway. Material strength properties and hydro-geological properties may be required to evaluate the soundness of the reservoir designs and choice of construction materials. The soil parameters shall be used in the design and quality control during construction. The consultant shall be required to identify the basic parameters to test for.

- ***Topographical Surveys.*** The Consultant will carry out topographical surveys to produce a topographic map to provide sufficient information for design of the embankment, spillway and reticulation for irrigation. The topographic area shall cover the area of the proposed embankment, spillway and the area immediately downstream of the embankment to the extent that will allow designing and qualifying reconstruction works. A detailed map of the area will be produced at a suitable scale (1:500 or 1: 1000) with contours at 0.5m intervals. The topographical survey should show the extent of borrow areas. Detailed Regular checks on the levels during construction shall be required to ensure correct measurements of work done and for monitoring purposes.

(iv) ***Design.*** The Consultant shall be required to utilize results from hydrological, geotechnical and topographical investigations to design the embankment, spillway and appropriate watering facilities. The design shall include detailed drawings (layout/setting out, geological profiles; profiles along the embankment and spillways; sections and structural details), bills of quantities and specifications for materials and

workmanship that will enable the contractor to execute the construction works and for quality control. A design report and tender documents will be produced at this stage.

(v) ***Procurement of Contractors*** .Whereas the XXXXX is responsible for procurement, the Consultant shall facilitate the process by participating in solicitation, pre-qualification, and assisting the Client in evaluation of bids for completion of the reservoirs and preparation of relevant documents as may be requested by the Client. The consultant will therefore be required to provide personnel and shall allot time for this task.

(vi) Construction Supervision

The Consultant will be required to supervise construction works in accordance with the terms, conditions and designs specifications as provided for in the contract documents. The Consultant shall manage the contract and will carry out quality, time and cost control to ensure that works are being carried out as provided for in the Contract on behalf of the Client. The Consultant shall specifically carry out the following duties:

- Establish supervisory and monitoring tools relevant to the works, examine plant, equipment and materials, and approve or reject as appropriate on the basis of standards. Such instructions shall be provided to Contractor in writing.
- Issue instructions related to management of the Contract to Contractors. Such instructions shall be in triplicate and shall be endorsed by site representatives of both the Consultant and the Contractor and a copy submitted to the Client as part of the Supervisor's daily report.
- Examine and approve the Contractors work programs and in addition review any aspect related to management of the contract and seek approval from the Client.
- Ensure that the Contractor: adheres to the design specifications throughout construction; uses the correct methods of construction; carries out materials tests as per established schedule following standard testing procedures and submits reports promptly.
- Inspects works executed, as and when it is due or necessary and certify works in part or whole for payment to the Contractor prior to forwarding the certificates to the Client approval and payment, facilitate the establishment of operation and maintenance system though skills development and organization in liaison with representatives of the Clients and recipients.
- The consultant shall develop a strategy for operation and maintenance, prepare documents and communication materials and initiate the implementation of the system; implement a skills training program during the construction phase and set up the management structure within the user community and district.

The Consultant is expected to provide in his proposal a work breakdown and schedule, which will enable him to accomplish the above requirements of the assignment.

4 Organization and Co-operation Arrangements

The Consultant will be directly supervised by the XXXXX Project Management Unit on behalf of the XXXXX Program- Coordination Unit. A Regional Project Steering Committee which consists of X high ranking Government Officers from the Governments of Tanzania will oversee the work of the consultant, while a National Liaison Officers from Tanzania will

coordinate the consultations at the national levels and liaison with the relevant institutions. The outputs from the study will be regularly communicated to the funding agencies (XXXXX) through the XXXXX. The client will hold discussions with the consultants at certain stages in the consultancy to ensure that work is proceeding along acceptable lines. For the purpose of these meetings, the consultant will produce brief progress reports on the status of his/her work, which will be incorporated into formal records of the meeting. The Client will provide (i) Facilitation, supervision and logistic assistance to the consultants (ii) organize for meetings to validate the report (iii) Provide office space for consultants to carry out their work and remit payment to the Consultant.

The Consultants will prepare a work schedule, Organize own accommodation, transport, and interpretation services, if any, examine all the relevant reports, articles and other information sources and visit and hold discussions with all the relevant institutions, departments and other stakeholders in Tanzania. In carrying out this consultancy, the consultant should consult with the XXXXX Office, the XXXXX District Executive Director, the Irrigation Officer and other strategic stakeholders in the district.

5 Reporting and Documentation

The Consultant will report to the Project Manager, XXXXX Project who will be responsible for approving the outputs. The Consultant will submit the following reports;

- ***Inception report.*** This will be submitted within two (2) weeks after commencement of the assignment. The report will contain, data gathered and examined, with comments on the scope of work and any pertinent aspects, requirements in terms of materials and logistics and ways of obtaining them, and a precise program for execution of the assignment.
- ***Preliminary design report (PDR).*** This report will be submitted following approval of the technical investigations and the detailed design of the dam and spillway structure including the basis for determining the dimensions and the structural characteristics of the different elements of the works, drawings of all the elements of the works to such detail as to enable their construction; bills of quantities and the preliminary estimates, specifications for workmanship and materials that are to be incorporated into the works and a proposal for the construction program. Investigations and design are expected to take not more than 4 weeks.
- ***Final Design Report (FDR) and Tender Documents.*** After review of the PDR by the client, the consultant shall prepare a Final design report incorporating comments from the Client. The FDR together with the tender documents will be submitted within 2 weeks from the date of communication of the Clients communication to the consultant.
- ***Procurement.*** Bid documents and the Contractors' Tender Evaluation Reports.
- ***Completion report.*** After completion of construction, the Consultant shall compile a draft final Report and submit it to the Client in two copies. This shall be within seven days of issuance of the final/completion certificate to the contractor. The Client will review this report and any comments made will be communicated to the Consultant for consideration. On receipt of the comments from the Client, the Consultant shall make the necessary corrections, compile the Final Report and submit to the Client within a period of fourteen days from the time the Client reacts to the Draft Report.

- ***Other Reports***

- ***Strategy for Operation and maintenance (O & M):*** The consultant shall prepare a strategy for operation and maintenance since O & M is a long-term strategy. The consultant will be required to prepare an action plan, training materials and documents for implementation.
- ***Monthly Progress Reports:*** The Consultant shall prepare and submit to the Client monthly progress reports. The reports will reflect the level of achievement with reference to the previous report and highlight all constraints and proposed remedial measures.
- ***Minutes of Site Meetings:*** The Consultant shall conduct monthly site meetings during the construction supervision phase which shall be attended by both the Contractor and Client. The Consultant shall compile the minutes and distribute to the members within seven days.

- ***All*** reports will be submitted in 5 copies including the original. In addition, soft copies (MS Word and Ms Excel) of the reports will be submitted on 2 CDs when submitting the draft and final reports of this assignment. All reports and communication materials developed by the consultant shall revert to the Project Management Unit.

6 Profile of the Consultant and Staffing Requirements

The assignment is expected to cover a period of twelve calendar months including the defects liability period. The Consultant is expected to set up a design and supervision team, of permanent staff, with expertise in the fields of Hydraulic Engineering, Civil Engineering Construction, Geo-technical Engineering, Land Surveying and Sociology. Short-term expertise of a social/institutional expert is expected for Operation and maintenance activities.

Qualifications of Consultant staff

- **Hydraulic Engineer- 3 Man months**. The Team Leader shall have a Masters degree in Hydraulic/Geotechnical/Hydrological Engineering with over 10 years experience in design of hydraulic structures. He/she will be required to have broad water resources management knowledge and skills, in addition to well-developed dam design and supervision skills.

- **Land/Quantity Surveyor- 2 Man months.** A land surveyor shall have a minimum BSc in Land surveying. He/she shall have a minimum of 10 years overall experience and 5 years relevant experience in surveying earth embankments for string water for agricultural and domestic purposes.

- **Geo-technical Engineer- One Man month.** The Geo-technical Engineer shall have a Masters degree in geotechnical engineering or engineering geology (with significant experience in ground investigations of water retaining structures.

- **Sociologist/Anthropologist- One Man month:** He/She will be responsible for the software aspects of the whole project and will head a team to carry out baseline surveys in the project areas. He/She will do the Socio-economic analysis and propose ways for Operation and maintenance and is responsible for identification of the training needs of the local authorities and district technical staff with regard to

implementation of such projects directly by the districts. He/she will advise the consultant's technical team on approach of imparting the desired skills. He /She will work hand in hand with the Design Engineer to see that the Software aspects are included in the design. A minimum of 10 years of professional experience on similar activities will be required.

The Consultant is expected to have an office within Tanzania, well equipped for the work. Among the requirements in terms of logistics is a four-wheel drive light vehicle (4WD), which would enable him to move through slippery terrain. The Consultant will build in his timeframe an allowance of time to cover the periods of procurement of Contractors and a six months defects liability period. The Consultant shall liaise with the Client to facilitate the process of procurement of the Contractors, especially in evaluation of tenders.

ESTIMATED MAN MONTHS

, Civil Engineering Construction, Short-term expertise of a social/institutional expert

Design Phase	MAN MONTHS, Design Phase	man months construction supervision	total
Hydraulic Engineer	1.0	2	3
Land/Quantity Surveyor	1	1	2
Geo-technical engineer	0.5	0.5	1
Sociologist/Anthropologist	0.5	0.5	1

(a) Civil/Hydrological Engineer (three man months)
(b) Land/Quantity Surveyor (two man months)
(c) Geotechnical Engineer (one man month)
(d) Sociologist/Anthropologist (one man month)

7 Quality Assurance and Quality Control

The Consultant will be required to demonstrate in their proposal, evidence of adoption of use of a Quality Assurance System (ISO 9001 or equivalent) as well as to describe how quality control will be implemented in the course of the project.

FEASIBILITY STUDY FOR MAHANDE IRRIGATION SCHEME TERMS OF REFERENCE

1. BACKGROUND

Agriculture production in a large part of Monduli district depend on rain fed which is however unreliable, thereby making the areas with relatively reliable water sources in the district for irrigated faming to remain as a potential grain basket for the district. The district is generally a net importer of food especially maize and bean, the exception being in year having rainfall above normal (viz. good year) when self-sufficiency in cereals is achieved.

Traditional irrigation activities in Monduli district have been practiced for over 50 year. The smallholder farmers in the district rely on irrigated farming as their primary economic activity. The areas with reliable surface water sources in the district are limited and found at comprise of the areas shown in Table 1 below.

Lack of irrigation system infrastructures and farm access/service roads are considered among the key constraints to improving irrigated agricultural production thereby reducing food insecurity in the schemes and affecting initiatives for alleviating poverty in the farming communities. This situation makes the Monduli District Authority and irrigation schemes farming community to strongly desire to minimize/remove the existing agricultural production constraints through modernizing the water-delivery and farming systems in order to improve the productivity and profitability from agriculture.

The district accords high priority to rehabilitation of the existing traditional irrigation schemes. The district has been cooperating with central government, development partners and individual irrigation farmers in promoting improvement of irrigation schemes. The district is continuously sourcing funds annually through DADP for improving the existing traditional small-scale irrigation schemes.

2. PURPOSE

The purpose of carrying out Feasibility study at Mahande is actually to investigate and recommend solution to the problems based on technical evaluation of alternatives including coming up with an engineers estimate. During this phase, a preliminary design of the irrigation infrastructures for Mahande smallholder irrigation will be carried out.

3. LOCATION

Mahande Irrigation scheme is located in Barabarani village, Mto wa Mbu Ward, Manyara Division in Monduli District of Arusha Region. The scheme is located at about 110 km from Monduli 120 km from Arusha Municipality. The scheme lies at Latitude 35^{O} 05' 00" E and Longitude 3 ^{O} 22' 05" S with an altitude of approximately 610m above mean sea level. The scheme is found at distance 2 km from the village centre and just adjacent to main road - Arusha - Ngorongoro). The neighbouring villages are Migombani and Majengo to the North, Lake Manyara conservation area to the South and West and Losirwa village in the East. The scheme has a command area of about 160 ha under irrigated paddy production. The village population is estimated at 1600. Generally, the scheme lies on a valley surrounded by escapement of Great Rift Valley and it is relatively flat.

In the scheme formulation process, Mahande Irrigation Scheme was ranked the first out of 13 schemes after screening, prioritization and consideration of the budget limitation, existing support and environmental issues. The scheme was selected as the priority scheme envisaged for improvement in the district. The district has included this scheme in the list that has been forwarded for consideration in the budget year 2008/2009.

4. SCOPE OF WORKS

4.1 Assessment of irrigation potential in the area by examining the land and water resources potential, estimation of the water demands (livestock and irrigation) in the area, etc. The input of agronomist will be required in carrying out this exercise.

4.2 Field Investigations:

The field investigation shall involve carrying out the following:

- **Hydrological Analysis:** Carrying out hydrological analysis in order to establish the hydrological characteristics and performance of the catchment and come up with realistic river flows / discharges capacities which will be used in the hydraulic designs of the intake weir and enable the preliminary design of the irrigation facilities. Water balance study will be conducted.

- **Topographical Surveys**: Carrying out topographical surveys to produce a topographic map that will to provide sufficient information for design of the canals, drains and structures for irrigation. The topographic area shall cover the whole scheme to the extent that will allow designing and qualifying reconstruction works. A detailed map of the area will be produced at a suitable scale (1:2000 or 1:5000) with contours at 0.25 metres intervals. Benchmarks will be established in the scheme area to allow regular checks on the levels during construction to ensure correct measurements of work done and for monitoring purposes. Longitudinal profile surveys of the existing canals and drains will be carried out. Their cross sections at reasonable intervals will also be taken. A Total Station will be made available for this survey and all measurement will be taken in X,Y,Z coordinates.

- **Soil Surveys**: The extent of fieldwork will depend on the variation of different soil units in the project area. Generally the fieldwork covering the proposed total area of 160 ha will consist of the following activities:

  (i) *Soil units identification by auger* - at-least one auger site per 8ha with a total of about 30 auger sites for the entire area, this activity is estimated to take 3 days and will involve 2 professionals and 2 labourers;

  (ii) *Soil mini pits and profile pits for observation and sampling* - at-least 4 mini pits and 6 profile soil pits will be required during fieldwork for the entire area. Two professionals would be involved, four (4) labourers will be engaged per pit and the fieldwork is estimated to take 5 days.

  (iii) *Number of samples* - from pits observation soil sampling will consist of 8 samples from mini pits (4 No. of mini pits x 2 samples from each pit) and 24 samples from profile pits (6 No. of profile pits x 4 samples from each pit) hence a total of 32 samples.

  (iv) *Laboratory analysis of the soil samples*.

4.3 Sociology:

The sociologist will carry out baseline survey in the project area. He shall conduct Socio-economic analysis and propose ways for Operation and maintenance for the scheme. He shall identify training needs of the local authorities and district technical staff with regard to implementation of such projects directly by the districts through advising on viable approach of imparting the desired skills. He will work hand in hand with the Design Engineer to see that the Software aspects are included in the design.

Technical plan will be set and agricultural information gathered from the beneficiaries. The Economic Internal Rate of Return (EIRR) and the Benefit Cost Ratio (B/C) for the project will be determined at this atage

4.4 Environmental Aspect:

The environmental engineer will carry out preliminary environmental impact assessment to assess potential significant risks and hazards associated with the project (including occupational health and safety. He shall identify appropriate mitigation measures to be incorporated in the design.

4.5 Preliminary Design:

We shall utilize the results from hydrological analysis and topographical surveys to design the appropriate irrigation facilities. The preliminary design shall include drawings (layout/setting out, profiles along the major canals and drains, cross sections and structural details), bills of quantities that will influence investment decision/financing agreement for execute of the construction works. The preliminary design report (PDR) and cost estimate will be produced at this stage.

The Feasibility Study Report will be produced and submitted to the client following completion of the preliminary design of irrigation facilities including the basis for determining the dimensions; bills of quantities and the preliminary cost estimation for the construction works.

5. EXPECTED OUTPUTS

- Water demand for the scheme
- Water available for irrigation and livestock
- Topographical maps, longitudinal profiles and cross sections of the existing major canals and drains, site plans for construction of important structures and report
- Socio-economic report
- EIA report
- Preliminary Design report
- Bills of quantities and engineers cost estimate for construction

6. WORK PLAN

The proposed work plan for implementation of the Feasibility Study is presented in Figure 1 below:

FEASIBILITY STUDY FOR MAHANDE IRRIGATION SCHEME IN MTO WA MBU - MONDULI DISTRICT
PROPOSED WORK PLAN

Item No.	Activity	FEBRUARY	MARCH	APRIL
1.	Assessment of irrigation potential I the project area			
2.	Collection of hydro-meteorological data and analysis			
3.	Conduct Socio-economic study			
4.	Conduct Preliminary EIA			
5.	Carry out topographical survey of the project area to update the existing data			
6.	Carry out designs of irrigation infrastructures			
7.	Preparation of bills of quantities and construction cost estimation			

COST ESTIMATE FOR CARRYING OUT FEASIBILITY STUDY FOR MAHANDE IRRIGATION SCHEME

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (Tshs)	AMOUNT (Tshs)
1	**ASSESSMENT OF IRRIGATION POTENTIAL IN THE PROJECT AREA**				
1.1	Agronomist	mandays	21	45,000.00	945,000.00
1.2	Driver	mandays	21	20,000.00	420,000.00
1.3	Fuel	liters	250	1,600.00	400,000.00
2	**CARY OUT HYDRO METEOROLOGICAL STUDY AND ANALYSIS**				
2.1	Hydrologist	mandays	21	45,000.00	945,000.00
2.2	Driver	mandays	21	20,000.00	420,000.00
2.3	Fuel	liters	250	1,600.00	400,000.00
3	**CARY OUT SOCIO-ECONOMIC STUDY**				
3.1	Sociologist	mandays	21	45,000.00	945,000.00
3.2	Driver	mandays	21	20,000.00	420,000.00
3.3	Fuel	liters	250	1,600.00	400,000.00
4	**CONDUCT EIA STUDY**				
4.1	Environmental Engineer	mandays	14	45,000.00	630,000.00
4.2	Driver	mandays	14	20,000.00	280,000.00
4.3	Fuel	liters	180	1,600.00	288,000.00
	SUB TOTAL CARRIED OVER TO NEXT PAGE				6,493,000.00

ITEM NO.	DESCRIPTION	UNIT	QTY	RATE (Tshs)	AMOUNT (Tshs)
	SUB TOTAL FROM PREVIOUS PAGE				6,493,000.00
5	**TOPOGRAPHICAL SURVEY**				
5.1	Land Surveyor	mandays	35	45,000.00	1,575,000.00
5.2	Technician	mandays	35	45,000.00	1,575,000.00
5.3	Driver	mandays	35	20,000.00	700,000.00
5.4	Casual labour, 6 people	mandays	210	3,000.00	630,000.00
5.5	Fuel	liters	600	1,600.00	960,000.00
6	**PRELIMINARY DESIGN**				
6.1	Design Engineer	mandays	28	45,000.00	1,260,000.00
6.2	Driver	mandays	2	20,000.00	40,000.00
6.3	Fuel	liters	100	1,600.00	160,000.00
6.4	Stationary	sum	1	300,000	300,000.00
7	**PREPARATION OF BILLS OF QUANTITIES AND CONSTRUCTION COST ESTIMATION**				
7.1	Quantity Surveyor	mandays	28	45,000.00	1,260,000.00
7.4	Stationary	sum	1	50,000.00	50,000.00
8	**REPORT WRITING**				
8.1	Professionals	sum	1	300,000.00	500,000.00
8.2	Stationary	Sum	1	150,000.00	200,000.00
8.3	Binding	sum	1	75,000.00	100,000.00
	TOTAL				15,803,000.00
	Add 20 percent to cover for contingencies				3,160,600.00
	TOTAL				18,963,600.00

FORM OF AGREEEMENT
ON
FEASIBILITY STUDY WORK

This Agreement, made (Date) between (Name and Address of the Client) (hereinafter called "the Client") on the one part and (Name and Address of the Contractor) (hereinafter called " the Contractor") on the other part.

Whereas the Client is desirous that certain works should be carried out, viz: (Name of Project) and has by the letter of Acceptance Ref. No. dated accepted a Tender or Estimation by the Contractor for execution, and completion of such Works based on the TOR on the implementation of Feasibility Study of …… irrigation scheme.

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to and;

2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz: -

    1. Form of Agreement
    2. Letter of Acceptance (see Annex-1)
    3. Contract Data (see Annex-2)
    4. General Conditions of Contract (see Annex-3)
    5. Any other document forming part of the contract (Minutes of clarifications, anti-bribery memorandum)

3. All the aforesaid documents are hereinafter referred to as the agreement and shall be taken as complementary and mutually explanatory of one another but in case of ambiguities or discrepancies shall take precedence in the order set out above.

4. In consideration of the payments to be made by the Client to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Client to execute and complete the works in conformity, in all respects, with the provisions of the Contract.

The Client hereby covenants to pay the Contractor in consideration of the execution and completion of the works, the sum of Tanzanian Shillings Only (Tsh /=), hereinafter referred to as the "Agreement Price", at the times and in the manner prescribed by the Contract.

IN WITNESS where of, the parties hereto have set their hands and seals on the day and year first above written.

ON BEHALF OF THE CLIENT:

Signature
(Name).....
.
(Occupation).....
.

ON BEHALF OF THE CONTRACTOR:

Signature
(Name).....
(Occupation).....

In the presence of

Signature
(Name).....
(Occupation).....
(Address).....

Annex-1 Letter of Acceptance

Ref. No.: .....

Date: .....

(Name and Address of Contractor) .....

.....

.....

.....

Dear Sir,

RE: LETTER OF ACCEPTANCE

This is to notify you that your quotation dated for ..... for execution of the Contract Price of accepted. ..... Only (Tsh /=), is hereby

You are requested to sign the Form of Agreement in our office on and commence the works within days from days after signing the agreement. .....

Sincerely,

(Signature)

(Name and Address of Owner) .....

.....

.....

cc.:

CONTRACT DATA

Name of Project: .....

.....

Clause-No.	
-	Contract start date: ..... days after date of signing the contract
3	Time for completion is on or before the **th day of ******, 20**. __
5	Advance payment (if applicable) is 40% of contract price. Acceptable collateral shall be in the form of bank guarantee.
-	Amount of liquidated damages: [Applicable/ Not Applicable]

Annex-3

GENERAL CONDITIONS OF CONTRACT

CONTENTS

ARTICLE 1. Definitions

In interpreting or construing this Agreement, the following expressions shall have the meanings hereby assigned to them except where the context otherwise requires:

"The Project" means (name of the Project) that will be implemented as the DADP irrigation scheme. The Project site(s) is/are located at (name of the site of the Project).

"The Client" means (name of the executing agency) and shall include any person or persons authorized by (name of the executing agency).

"The Service" means all services to be furnished by the Contractor, as stipulated in Article 2 of this Agreement; or the performance of such services.

"The Contractor(s)" means the person or persons (physical persons), firm or company (juridical persons) who has (have) been awarded the contract by the Client and includes the Contractor's representatives, successors and permitted assigns.

"The Contract(s)" means the contract(s) to be concluded between the Client and the Contractor(s).

Words importing the singular only also include the plural and vice versa where the context requires. Words indicating one gender include all genders.

ARTICLE2. Scope of Service of the Contractor

2.1 The Contractor shall implement the Feasibility Study for the Project, and prepared and submitted the Study Report to the Project Committee. The Contractor's services to be rendered shall consist of the following items which are showing in detailed in the TOR:

1) The Contractor shall implement the Feasibility Study on the Project. The study consists of topographic survey, social study, EIA study, preliminary design study and others. The detailed study scope will be stipulated in the TOR for the FS which is attached an appendix.

2) The Contractor shall evaluate those study results and study the feasibility of the Project for the last time. The study result will be submitted to the Project Committee.

2.2 The scope of the Service prescribed in Paragraph 2.1 above shall be limited to the extent of the items mentioned in the TOR and may not be modified without the written consent of both parties hereto.

ARTICLE 3. Period of Execution of Service

The Contractor shall complete the Service on or before the **th day of ******, 20**.

ARTICLE 4. Remuneration

The Client shall remunerate the Contractor from the Project budget with a total amount of *** million *** *** thousand Tanzanian Shillings (Tsh **,***,000) as the Agreement Price for the Service to be rendered by the Contractor pursuant to this Agreement.

ARTICLE 5. Payment

5.1 Terms of Payment

The payment of the contract amount will be made in Tanzanian Shillings-denominated check within ten (10) working days after the Client has received from the Contractor the debit note issued by her/him after getting the acceptance of the Works by the Client.

5.2.1 Advance Payment

Not withstanding Sub-Clause 6.1 above, the Client can make a payment to the Contractor in advance * million * thousand Tanzanian Shilling (Tsh **,***,000), which corresponds to forty percent (40%) of the total contract price, if so specified in the Contract Data. In such case, the Contractor shall guarantee the advance payment amount in the form of bank guarantee acceptable to the Client. The payee of the guarantee shall be the Client and shall be valid until the completion of the Works. All expenses such as the banker's commission in order to furnish the guarantee of the advance payment shall be borne by the Contractor.
The Client shall release the above -mentioned guarantee when the Client receives the final report of Feasibility Report.

5.2.2 Final Payment

* million *** * thousand Tanzanian Shilling (Tsh **,***,000), which corresponds to sixty percent (60%) of the Agreement Price, shall be paid upon completion of the Service under this Agreement. The request for the final payment shall be accompanied with the certificate of completion of the Service issued by the Client.

ARTICLE 6. Client's Responsibilities

6.1 So as not to delay the Service, the Client shall, within a reasonable period of time, provide the Contractor with all information in his power to obtain which may pertain to the Service free of cost.

6.2 The Client shall inform the Contractor of the nature and content of all laws relating to the execution of the Feasibility Study in advance.

6.3 The Client shall examine the documents submitted by the Contractor and shall render decisions pertaining thereto promptly in order to avoid unreasonable delay in the progress of the Service.

ARTICLE 7. Contractor's Liabilities

7.1 The Contractor shall perform the Service stipulated in Article 3 of this Agreement with due diligence and efficiency, in conformity with generally accepted professional techniques and practices, and observe sound management practice, so that the Feasibility Study may be brought to a successful completion.

7.2 The Contractor shall have no liability whatsoever for any other part of the Feasibility Study implemented by him.

ARTICLE 8. Right of Assignment

Neither of the parties hereto shall assign this Agreement or any part thereof to any third party without prior written consent of the other party.

ARTICLE 9. Force Majeure

In the event of any loss or damage happening from any operation of the forces of nature against which the parties to the contract could not reasonably have foreseen, the Contractor shall rectify the loss or damage. The Client shall determine an addition to the contract price and may consider an extension of the contract period.

ARTICLE10. Applicable Law

This Agreement shall be governed by and interpreted in accordance with the laws of Tanzania.

ARTICLE 11. Settlement of Disputes

If disputes arise they shall be settled by mutual discussions. If the discussions fail to produce an agreement, either party has the option to go for arbitration in accordance with the laws of Tanzania.

ARTICLE 12. Language and Measurement System

12.1 All correspondence between the two parties including notices, requests, consents, offers, and demands shall be made in English. All drawings, specifications, reports, and other documents shall also be prepared in English.

12.2 All documents made under this Agreement shall adopt the metric system and the Gregorian calendar day.

ARTICLE 13. Amendment and Modification

Any amendments or modifications, if necessary, may be negotiated between the parties hereto and shall be agreed by a written document signed by both parties.

ARTICLE 14. Termination of Contract

14.1 If the Contractor fails to commence the works within the specified time or there is any reason to believe that he may not complete the works within the specified time or there are delays beyond the completion date or he fails to comply with any one of the contract conditions or he pays no attention to the instructions issued by the Engineer or he becomes bankrupt, the Employer shall be entitled to terminate the contract and engage a new Contractor to carry out the works.

14.2 If the Employer fails to pay the Contractor within 60 days of the date of the Engineer's certificate, the Contractor may terminate the contract.

ARTICLE 15. Intellectual Property

The drawings, specifications and other documents, as instruments of the Service, are the intellectual property of the Contractor and shall not be used for any work other than the Project without prior written approval of the Contractor. The copyright of all documents prepared by the Contractor in connection with this Agreement rests with the Contract.

ARTICLE 16. Confidentiality

The Contract and its Personnel shall not, during the terms of the Agreement and thereafter, and whether its personnel are presently employed or not, disclose proprietary or confidential information relating to the Project, the Service, the Contract, or the Client's business or operation without the prior written consent of the Client.

ARTICLE 17. Miscellaneous

The Client and the Contract shall perform their obligations and other functions covered by this Agreement with sincere cooperation and in good faith.

ARTICLE 18. Entire Agreement

This Agreement sets forth the entire agreement between the parties in respect of the subject matter hereof and supersedes and cancels any and all previous agreements, negotiations, commitments, and writings in respect of the subject matter thereof.

ARTICLE 19. Notice

All notices pertaining to this Agreement between the Client and the Contract shall be sent in writing by registered airmail, telegraph, or facsimile or shall be handed to the addresses so stated herein. Such notices shall take effect from the date of receipt by the other party. In case either party hereto changes the address, the party concerned shall give such notice to the other party beforehand.

The Client:
Name : _____
Address : _____
Telephone : _____
Facsimile : _____

The Contractor:
Name : _____
Address : _____
Telephone : _____
Facsimile : _____

THE UNITED REPUBLIC OF TANZANIA

THE ENVIRONMENTAL (REGISTRATION OF ENVIRONMENTAL EXPERTS) REGULATIONS, 2005 – G.N. NO. 348 OF 2005

THE ENVIRONMENTAL IMPACT ASSESSMENT AND AUDIT REGULATIONS, 2005 – G.N. NO. 349 OF 2005

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G.N. No. 349 (contd.)

FIRST SCHEDULE

(Made under Regulation 6 (1))

TYPES OF PROJECTS REQUIRING AND NOT REQUIRING EIA

(a) Type A -Project requiring a mandatory EIA.
Project is likely to have significant adverse environmental impacts and that in-depth study is required to determine the scale, extent and significance of the impacts and to identify appropriate mitigation measures.

(b) Type B -Project requiring Preliminary Environmental Assessment Project is likely to have some significant adverse environmental impacts but that the magnitude of the impacts are not well-known, a preliminary environmental assessment is required to decide whether the project can proceed without a full environmental impact assessment.

A. LIST OF PROJECTS REQUIRING EIA (MANDATORY LIST)

1. Agriculture

(i) Large scale cultivation.
(ii) Water resources development projects (dams, water supply, flood control, irrigation, drainage))
(iii) Large scale mono-culture (cash and food crops including floriculture)
(iv) Biological Pest Control
(v) Agricultural projects necessitating the resettlement of communities.
(vi) Introduction of new breeds of crops.
(vii) Introduction of Genetically Modified Organisms (GMOs)

2. Livestock and Range management
(i) Large Scale livestock movement
(ii) Introduction of new breeds of livestock including Genetically Modified breeds
(iii) Introduction of new or alien foreign species
(iv) Intensive livestock rearing areas

3. Forestry
(i) Timber logging and processing
(ii) Introduction of new tree species and development of forest plantations
(iii) Selective removal of single tree species
(iv) Biological pest control
(v) Afforestation and reforestation for purpose of carbon sequestration
(vi) Construction of roads inside forest reserve
(vii) Commercial charcoal, firewood and other forest harvest operations
(viii) Establishment of commercial logging or conversion of forested land to other land uses within catchments areas

4. Fisheries
(i) Medium to large scale fisheries
(ii) Artificial fisheries (Aqua-culture for fish, algae, crustaceans shrimps, lobster or crab)

(vii) Development of residential and commercial estates on ecologically sensitive areas including beach fronts
(viii) Dredging of bars, greyones, dykes and estuaries

B· LIST OF SMALL-SCALE ACTIVITIES AND ENTERPRISES THAT REQUIRE REGISTRATION (MAY OR MAY NOT REQUIRE EIA).

(i) Fish culture
(ii) Small animal husbandry and urban livestock keeping
(iii) Horticulture and floriculture
(iv) Wildlife catching and trading
(v) Charcoal production
(vi) Bark for tanning processing
(vii) Brewing and distilleries
(viii) Bird catching and trading
(ix) Hunting
(x) Wildlife ranching
(xi) Zoo and sanctuaries
(xii) Tie and dye making
(xiii) Salt pans
(xiv) Urban agriculture.
(xv) Hospitals and dispensaries, Schools, Community centre and Social halls, play grounds
(xvi) Market places (livestock and commodities).
(xvii) Blacksmiths
(xviii) Garages
(xix) Tile manufacturing
(xx) Kaolin manufacturing
(xxi) Livestock stock routes
(xxii) Tobacco curing
(xxiii) Sugar refineries
(xxiv) Tanneries
(xxv) Pulp plant
(xxvi) Oil refineries and ginneries
(xxvii) Artisanal and small scale mining
(xxviii) Rural road

SECOND SCHEDULE

(Made under Regulation 9 (1))

PROJECT SCREENING CRITERIA

The following shall be screening criteria to be used for purposes of compliance with the requirements of these Regulations:

G.N. No. 349 (contd.)

1. The project will not substantially use a natural resources in a way that pre-empts the use, or potential use, of that resource for any other purpose.

2. Potential residual impacts on the environment are likely to be minor, of little significance and easily mitigated.

3. The type of project, its environmental impacts and measures for managing them are well understood in Tanzania.

4. Reliable means exist for ensuring that impact management measures can and will be adequately planned and implemented.

5. The project will not displace significant numbers of people, families or communities.

6. The project is not located in, and will not affect, any environmentally sensitive areas such as:

(a) national parks;
(b) wetlands;
(c) productive agricultural land;
(d) important archaeological, historical and cultural sites;
(e) areas protected under legislation;
(f) areas containing rare or endangered flora or fauna;
(g) areas containing unique or outstanding scenery;
(h) mountains or developments on or near steep hill-slopes;
(i) dry tropical forests (e.g. Brachystegia woodlands);
(j) development near Lakes or its beaches;
(k) development providing important resources for vulnerable groups such as fishing communities along the lake-shore.
(l) development near high population concentrations or industrial activities where further development could create significant environmental problems; and
(m) prime ground-water re-charge areas or areas of importance for surface run off of water.

7. The project type will not result in:

(a) policy initiatives which may affect the environment such as changes in agricultural pricing subsidies or the tobacco liberation;
(b) major changes in land tenure; or
(c) changes in water use though irrigation, drainage promotion or dams, changes in fishing practices.

8. The project will not cause:

(a) adverse socio economic impact,
(b) land degradation water pollution;
(c) water pollution;
(d) air pollution;
(e) damage to wildlife and habitat;
(f) adverse impact on climate and hydrological cycle;
(g) air pollution; and
(h) creation of by-products, residual or waster materials which require handling and disposal in a manner that is not regulated by existing authorities.

9. The project will not cause significant public concern because of potential environmental changes. The following are guiding principles:

(a) is the impact positive, mainly begin or harmful;
(b) what is the scale of the impact in terms of area affected numbers of people or wildlife;
(c) what is the intensity of the impact;
(d) what will be the durationrofthe impact;
(e) will there be cumulative effects from the impact;
(f) are the effects politically controversial;
(g) have the main economic, ecological and social costs been quantified;
(h) will the impact vary by social group or gender; and
(i) is there any international impact due to the proposal projects.

10. The project will not necessitate further development which is likely to have a significant impact on the environment.

THIRD SCHEDULE

FORMS FOR EIA

FORM No. I (Regulation 7)

Application Reference No. .....

THE ENVIRONMENT MANAGEMENT ACT, 2004
SUBMISSION OF PROJECT BRIEF

PART A

DETAILS OF PROPONENT

Name of proponent (Person or Firm) PIN No Address Name of contact person Telephone No. Fax No. E-mail

PART B

DETAILS OF THE PROJECT

I. PROPOSED UNDERTAKING/DEVELOPMENT

Title of Proposal (general classification of undertaking)

Description of Proposal (nature of undertaking, unit processes [flow diagram], raw materials list of chemicals (source, types an quantities), storage facilities,

G.N. No. 349 (contd.)

wastes/by-products {solid, liquid and gaseous) ----------
Scope of Proposal (size of labour force, equipment and machinery, installed/production capacity, product type, area covered facility/proposal, market)

---

2. PROPOSED SITE
Location (attach a site plan/map) ----------
Current zoning ----------
Distance to nearest residential and/or other facilities ----------
Adjacent land uses (existing & proposed)----------
Site description ----------

3. INFRASTRUCTURE AND UTILITIES
Structures (buildings and other facilities)----------

Land required ----------
Water (source, quantity)----------
Power (type, source & quantity) ----------
Road Other major utilities (e.g. sewerage, etc.) ----------

4. ENVIRONMENTAL IMPACTS
Potential environmental effects of proposed undertaking (both constructional and operational phases).

---

5. OTHER ENVIRONMENTAL ISSUES
Potential significant risks and hazards associated with the proposal (including occupational health and safety). State briefly relevant environmental studies already done and attach copies as appropriate.

PART C

DECLARATION BY THE PROPONENT

I hereby certify that the particulars given above are correct and true to the best of my knowledge.

....

Name..... Position.....

Signature .....

On behalf of.....

Date .....

(Firm name and Seal)

PART D

DETAILS OF ENVIRONMENTAL IMPACT ASSESSMENT EXPERT

Name (individual/firm) .....
Certificate of registration No. .....
Address .....
Tel ..... Fax..... E-mail.....

PART E

FOR OFFICIAL USE

Decision of the Council .....
Comments .....

.....
Officer ..... Sign ..... Date .....

NB:

1. If the Project Brief does not contain sufficient information required under the Environmental Impact Assessment Regulations the applicant may be requested to give further information concerning the project or be notified of any defects in the application and may be required to provide the additional information.

2. Any person who fraudulently makes a false statement in a project report or alters the project report commits an offence.

Important notices: Please submit the following:
(a) three copies of this form;
(b) 10 copes of the project brief;
(c) the prescribed fees to:
Director General,
The National Environment Management Council,
.....,
P.O. Box .....,
Dar es Salaam.
Tel ..... Fax.....
E-mail .....

Form No. 2 (Regulation 21)

Application Reference No. .....
FOR OFFICIAL USE

Appendix 5-5(a)

UMOJA WA WATUMIAJI MAJI YA UMWAGILIAJI USSOKE MLIMANI/YELAYELA

(UMWAMUUYE)
S.L.P 44

USSOKE
21/07/2016

OFISI YA MTENDAJI WA KIJIJI
KIJIJI CHA USSOKE MLIMANI
S.L.P 44
USSOKE

YAH: <u>UTAMBULISHO WA KAMATI YA UJENZI WA SKIMU YA USSOKE MLIMANI/YELAYELA YENYE</u>

Rejea kichwa cha habari hapo juu.

Umoja wa watuiaji maji ya Umwagiliaji katika skimu ya Ussoke Mlimani inawatambulisha wajumbe kumi wa kamati tajwa hapo juu.

Kamati ya Ujenzi ilichaguliwa na mkutano mkuu wa UMWAMUUYE katika mkutano uliofanyika tarehe 30/06/2016 mara baada ya Mafunzo ya matumizi ya Mwongozo wa Umwagiliaji yaliyofanyika kijijini Ussoke.

Kamati hii ina uongozi wake na inajiendesha kwa mujibu wa taratibu za Umwagiliaji.

Naambatanisha majina kumi ya wanakamati hao ikiwa na jinsia Ke 04 na Me 06.

Nakutakia utekelezaji mwema kwa hatua zinazofuata.

……
Katibu wa UMWAMUUYE
Muhuri……..

Appendix 5-5(b)

HALMASHAURI YA WILAYA YA URAMBO

OFISI YA MTENDAJI WA KIJIJI
KIJIJI CHA USSOKE MLIMANI

S.L.P 44
USSOKE
22/07/2016

Kumb: UH/K/4/Urambo/36

YAH: KUITAMBULISHA KAMATI YA UJENZI YA SKIMU YA UMWAGILIAJI USSOKE MLIMANI.

Husika na somo tajwa hapo juu.

Ofisi ya kijiji cha Ussoke Mlimani inaitambulisha rasmi kamati tajwa hapo juu ikiwa na wajumbe Kumi waliochaguliwa na na wanaumoja wa Umwagiliaji katika skimu ya Ussoke Mlimani katika kikao chao cha kilichofanyika tarehe 30/06/2016.

Uchaguzi huu ulifanyika mara baada ya Mafunzo kufanyika kwa wakulima kuhuhsu matumizi ya Mwongozo Kabambe wa Umwagiliaji na TUME YA TAIFA YA UMWAGILIAJI, Kanda ya Umwagiliaji na Halmashauri ya Wilaya ya Urambo.

Aidha ifahamike rasmi akaunti tajwa hapo juu ndio itakayotumika kutunza fedha za uendelezaji wa mradi kama itakavyoidhinishwa katika mkataba wa makubaliano ya utekelezaji wa Mradi.

…….

Village Executive Officer (VEO)

Nakala

- Ofisi ya Kanda-TABORA
- Ofisa kilimo Wilaya
- Umoja wa Umwagiliaji

Appendix 6-1 Sample of Project Implementation Agreement

PROJECT IMPLEMENTATION AGREEMENT

THIS AGREEMENT, made the ……day of July, 2016

Between

The District Executive Director,

Urambo District Council,

P.O. Box 170,

Urambo (hereinafter called "District Council")

And.

The Chairperson of the Project Committee of Ussoke Mlimani

Smallholder Irrigation Scheme (hereinafter called "the Committee")

And

Zonal Irrigation Engineer

P.O.Box 1053

TABORA

(Hereinafter called "Zone Irrigation office")

of the other parts.

WHEREAS THE three parties are desirous that the work for the Ussoke Mlimani Irrigation Scheme (hereinafter called "the works") should be executed smoothly and completely.

NOW THIS AGREEMENT WITNESSES as follows: -

1. The Council shall be ready to disburse for the works approximate amount of 331 million Tshs. to Project Committee Account No 51310012145(Account name; KAMATI YA UJENZI WA SKIMU YA USSOKE MLIMANI)by the end of August 2016.

2. The Project Committee shall ensure Irrigator's Organization (UMWAMUUYE) to contribute 20% of total construction cost in kind by excavating 14 Tertiary canals and Drainage canal as per design.

3. The Project Committee shall supervise the works (Contractor and Irrigator Organization) in collaboration with Technical staff from District Council and Zonal Irrigation Office.

4. The Committee reserves the rights to request any amendment to the works in case the Committee judges the works is not appropriate as per design.

5. Zonal irrigation office shall provide project supervisor to ensure quality control of irrigation and drainage infrastructure in collaboration with supervisor from Urambo District Council.

6. The Committee shall handover to Irrigator's Organization (UMWAMUUYE) upon completion of works, which shall have full responsibility for Operation and Maintenance of the works thereafter.

IN WITNESS whereof the parties thereto have caused this agreement to be executed the day and year first before written.

in the presence of;

District Executive Director,

Name:……signature:……Date……

Chairperson of the project Committee,

Name:……signature:……Date……

Zonal Irrigation Engineer,

Name:……signature:……Date……

Before Me

Name. ……

Address. ……

Signature. ……

Date. ……

MAKUBALIANO YA UTEKELEZAJI WA MRADI

MAKUBALIANO HAYA,yamefanyika tarehe …….. Julai, 2016

Kati ya

Mkurugenzi Mtendaji,

Halmashauri ya Wilaya ya Urambo ,

S.L.P 170,

Urambo(hapa anajulikana kama "HALMASHAURI YAWILAYA")

Na.

Mwenyekiti wa Kamati ya Ujenzi Ussoke Mlimani

(hapa anajulikana kama "KAMATI")

Na

Mhandisi Umwagiliaji Kanda

S.L.P 1053

TABORA

(hapa anajulikana kama "Ofisi ya Umwagiliaji Kanda")

Kwa pande zote.

AMBAPO pande zote tatu zimeridhia kwamba kazi za Ujenzi wa skimu ya Umwagiliaji ya Ussoke Mlimani(hapa inajulikana(KAZI) lazima itekelezwe kwa usahihi kama ilivyokubaliwa.

MAKUBALIANO HAYA YANASHUHUDIA yafuatayo:-

1. Halmashauri ya Wilaya ya Urambo itakuwa tayari kuhamisha fedha za ujenzi kiasi cha Tshs 331 Million kwenda Akaunti namba 51310012145(Jina la akaunti:KAMATI YA UJENZI SKIMU YA USSOKE MLIMANI) ifikapo mwisho wa mwezi wa Nane 2016.

2. Kamati ya Ujenzi wa Mradi itahakikisha Umoja wa Umwagiliaji(UMWAMUUYE) unachangia 20% ya gharama za ujenzi wa Mradi kwa kujitolea nguvu kazi za kuchimba mifereji 14 ya mashambani na mfreji wa maji ya ziada.

3. Kamati ya Ujenzi wa Mradi itasimamia kazi za ujenzi (zitakazofanywa na Mkandarasi na Wanaumoja) kwa kushirikiana na wataalam kutoka Wilayani na Ofisi ya Umwagiliaji Kanda.

4. Kamati ya Ujenzi wa Mradi itakua na haki ya kuomba mapitio ya kazi za ujenzi wa mradi iwapo yataonekana mapungufu kulingana na Usanifu.

5. Ofisi ya Umwagiliaji Kanda itatoa Msimamizi akishirikiana na Msimamizi kutoka Halmashauri ya Wilaya ya Urambo.

6. Kamati ya Ujenzi wa Mradi itakabidhi miundombinu ya Umwagiliaji kwa Umoja wa Umwagiliaji(UMWAMUUYE) mara kazi itakapokamilika, ambao(UMWAMUUYE) watakuwa na jukumu la utunzaji na Uendeshaji wa Miundombinu hiyo.

KATIKA USHAHIDI ambapo pande zinazohusika zimesababisha makubaliano haya kutekelezwa baada ya kusomwa, kuridhia na kusainiwa.

Mbele ya ;

Mkurugenzi Mtendaji wa Wilaya ya Urambo,

Jina:……Sahihi……Tarehe……

Mwenyekiti wa Kamati ya Ujenzi wa Mradi,

Jina:……Sahihi:…….Tarehe…….

Mhandisi Umwagiliaji Kanda

Jina:……Sahihi…….Tarehe……

Imeshuhudiwa na

Jina…….. ……

Anuani……..

Sahihi ……

Tarehe ……

Appendix 7-1 Sample of support to the Irrigators' contribution

A part of the works of the scheme will be carried out by the Irrigator' organization's own work forces as a rule of the government's policy. However, it is very difficult for them to do the specified work by themselves. In this context, the contractor shall carry out the following works to help Irrigator' organization make it easier to
perform their duty.

BILL OF QUANTITIES AND COST ESTIMATES

GENERAL SUMARY

BILL No.	DESCRIPTION	AMOUNT Tsh
1.00	HEADWORKS	
6.00	SECONDARY CANAL	
7.00	BILL NO.7: FIELD CANALS(EXCEPT EXCABATION WORK)	
8.00	BILL NO.8: TECHINICAL SUPORT FOR IRRIGATOR' CONTRIBUTION ON CONSTRUCTION OF FIELD CANALS	
9.00	BILL NO.9: TECHINICAL SUPORT FOR IRRIGATOR' CONTRIBUTION ON CONSTRUCTION OF FIELD DRAINS	

BILL OF QUANTITIES AND COST ESTIMATES FOR

BILL NO.7 : FIELD CANALS

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Tsh)	AMOUNT (Tsh)
7.0	**FIELD CANALS**				
7.1	Top soil stripping(7920m)	m2	17424		
7.2	Earth filling and compaction	m3	xxxxx		
7.3	Excavation and trim to profile (Irrigator' contribution)	m3	0		
	Subtotal				

BILL OF QUANTITIES AND COST ESTIMATES FOR

BILL NO.8 : TECHINICAL SUPORT FOR IRRIGATOR' CONTRIBUTION ON CONSTRUCTION OF FIELD CANALS .

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Tsh)	AMOUNT (Tsh)
8.0	**FIELD CANALS**				
8.1	Staking of pegs at 50m intervals and changing points of profile in accordance with the drawings	Point	Xxxxx		
8.2	Excavation and trim to profile at staked points	point	xxxxx		
8.3	Preparation of wooden frame works and installation of the frames to the staked points at specified level and location in accordance with the drawings	point	xxxxx		
	Subtotal				

BILL OF QUANTITIES AND COST ESTIMATES FOR

BILL NO.9: TECHINICAL SUPORT FOR IRRIGATOR' CONTRIBUTION ON CONSTRUCTION OF FIELD DRAINS .

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (Tsh)	AMOUNT (Tsh)
9.0	**FIELD CANALS**				
9.1	Staking of pegs at 50m intervals and changing points of profile in accordance with the drawings	Point	Xxxxx		
9.2	Excavation and trim to profile at staked points	point	xxxxx		
9.3	Preparation of wooden frame works and installation of the frames to the staked points at specified level and location in accordance with the drawings	point	xxxxx		
	Subtotal				

PART 8 TECHNICAL SUPPORTS FOR IRRIGATOR' CONTRIBUTION

801 GENERAL

A part of the works of the scheme will be carried out by the Irrigator' organization's own work forces as a rule of the government's policy. However, it is very difficult for them to do the specified work by themselves. In this context, the contractor shall carry out the following works to help Irrigator' organization make it easier to perform their duty.

802 STAKING OF PEGS

The Contractor shall stake pegs at 50m intervals, bending points and changing points of profile along the center line of the specified structures in accordance with the drawings

803 EXCABATION AND TRIM TO PROFILE

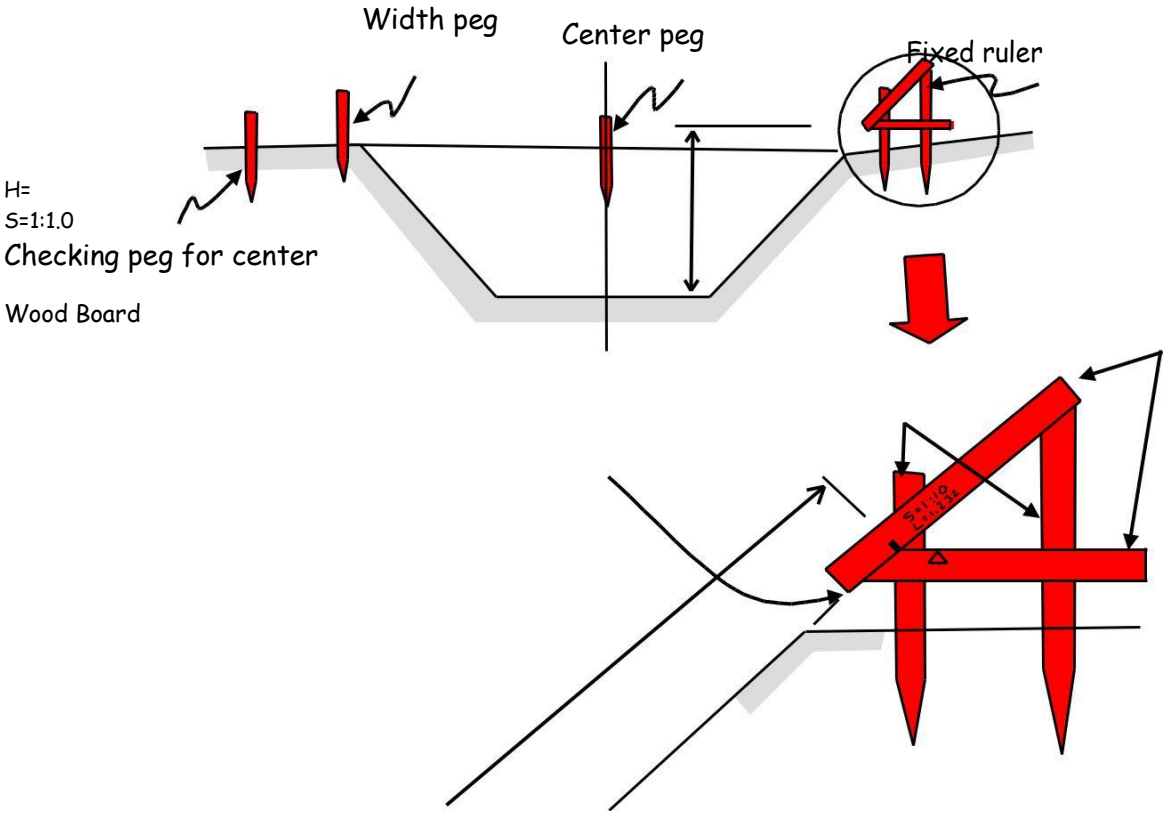
The contractor shall excavate and trim to profile at the staked points in order to install wooden frames specified in the following as specified the above in accordance with the drawings or direction of the consultant.

804 PREPARATIONS AND INSTALLATION OF WOODEN FRAME WORKS

The Contractor shall prepare wooden frame works conformed with the profile specified in the drawings and install the frames to the staked points at specified level and location in accordance with the drawings.

(Note) Example of wooden frame

Excavation



OPERATION AND MAINTENANCE MANUAL

(4) Roads

4.2.2 Damage inspection

(1) Cause of Damages

(2) Inspection and Action

4.3 Maintenance Activities

(1) Mwega Headworks

(2) Canals and Related Structures

(3) Drainage

(4) Roads

(1) Weeding

(2) Desilting

(1) Backfilling around structures

(2) Rubble packing

4.4.3 Minor Repair to Structures

(1) Cement mortar

(2) Concrete

(1) Stripping of top soil

(3) Heightening and widening of canal bank and farm road

Chapter 5 PROJECT BUDGET, WATER FEE AND OTHER ACCOUNTING PROCEDURE

5.1 Budget of the Project

5.2 Bank Account

5.3 Accounting Book and Cash Receipt Systems

5.3.1 Accounting Book

5.3.2Cash Receipt Systems

5.4 Water Fee Collection

5.5 Purchasing Procedure

5.6 Entry Fee and Shares

DETAILED DESIGN OF MAHANDE IRRIGATION SCHEME TERMS OF REFERENCE

1. BACKGROUND

Agriculture production in a large part of Monduli district depend on rain fed which is however unreliable, thereby making the areas with relatively reliable water sources in the district for irrigated faming to remain as a potential grain basket for the district. The district is generally a net importer of food especially maize and bean, the exception being in year having rainfall above normal (viz. good year) when self-sufficiency in cereals is achieved.

Traditional irrigation activities in Monduli district have been practiced for over 50 year. The smallholder farmers in the district rely on irrigated farming as their primary economic activity.

Lack of sound irrigation facilities and farm access / service roads are considered among the key constraints to improving irrigated agricultural production thereby reducing food insecurity in the schemes and affecting initiatives for alleviating poverty in the farming communities. This situation makes the Monduli District Authority and irrigation schemes farming community to strongly desire to minimize / remove the existing agricultural production constraints through modernizing the water-delivery and farming systems in order to improve the productivity and profitability from agriculture.

The district accords high priority to rehabilitation of the existing traditional irrigation schemes. The district has been cooperating with central government, development partners and individual irrigation farmers in promoting improvement of irrigation schemes. The district is continuously sourcing funds annually through DADP for improving the existing traditional small-scale irrigation schemes. For example, the district sent the request to the PMO-RALG to solicit funds from DIDF for improvement of Mahande Irrigation Scheme. Unfortunately no fund was allocated for the scheme improvement.

In the year 2007/2008 JICA through TC-DADP set aside a total of Tshs 27,261,600/= for conducting feasibility study for Mahande Irrigation Scheme from which the following aspects were covered:

- Assessment of irrigation potential in the scheme area
- Hydrological study and analysis
- Topographical survey of the scheme area
- Soil survey
- Socio-economic study
- Preliminary environmental examination
- Preliminary design
- Bills of quantities and construction cost estimation

However, in the current financial year 2008/2009 the following funds have been so far set aside for improvement of Mahande Irrigation Scheme:

Name of Organization	Amount (Tshs)
Ministry of Water and Irrigation through its department of Irrigation and Technical Services (NIDF)	250,000,000
JICA through TC-DADP GL	60,000,000
Monduli District Council	18,000,000
Beneficiaries contribution in kind (20% of investment cost)	82,000,000
TOTAL	**410,000,000**

2. PURPOSE

The purpose of carrying out detailed design for Mahande Irrigation Scheme is to prepare detailed design report and tendering documents based on the feasibility report and the available budget for Phase I (Tshs 410 million).

Working drawings will be prepared which shall be used in the calculation of the bill of quantities as well as during construction stage. These drawings shall provide enough detail and information to enable the designer, quantity surveyor and even an Irrigation Officer to prepare the bill of quantities or use during construction. The maps will serve as future reference to anyone who wants to obtain information about the scheme, e.g. during the

rehabilitation or expansion. The contour map has a lot of information, hence will serve as the basis for updating the scheme layout if necessary. Reference points such as benchmarks shall be checked to be included in the map to allow for the proper setting out of the layout during construction stage. The Detailed Design Report will be prepared.

3. LOCATION

Mahande Irrigation scheme is located in Barabarani village, Mto wa Mbu Ward, Manyara Division in Monduli District of Arusha Region. The scheme is located at about 110 km from Monduli 120 km from Arusha Municipality. The scheme lies at Latitude 35^{o} 05′ 00″ E and Longitude 3^{o} 22′ 05″ S with an altitude of approximately 610m above mean sea level. The scheme is found at distance 2 km from the village centre and just adjacent to main road - Arusha - Ngorongoro). The neighbouring villages are Migombani and Majengo to the North, Lake Manyara conservation area to the South and West and Losirwa village in the East. The scheme has a command area of about 160 ha under irrigated paddy production. The village population is estimated at 1600. Generally, the scheme lies on a valley surrounded by escapement of Great Rift Valley and it is relatively flat.

In the scheme formulation process, Mahande Irrigation Scheme was ranked the first out of 13 schemes after screening, prioritization and consideration of the budget limitation, existing support and environmental issues. The scheme was selected as the priority scheme envisaged for improvement in the district. The district has included this scheme in the list that has been forwarded for consideration in the budget year 2008/2009.

4. ACTIVITIES PROPOSED IN THE FEASIBILITY STUDY

The feasibility study proposed the following activities for construction at Mahande Irrigation Scheme which was estimated to cost Tshs 718,424,300/= and not Tshs 660,980,650/= (including 10% to cover for contingencies) as reported in the feasibility report:

S/NO.	DESCRIPTION	COST (Tshs)
4.1	**Diversion Headworks**	
	• Construction of diversion headworks made of reinforced concrete to apron, cut off walls, wing walls and abutment walls; and Plumstone concrete to main weir body and stilling basin	97,335,000
4.2	**Mahande Main Canal**	
	• Construction of check structures, 22 Nos.	31,769,000
	• Construction of turnout structures, 31 Nos.	33,139,000
	• Construction of road culverts, 19 Nos.	33,342,000
	• Lining of main canal, 1.2 km long using stone masonry	81,730,000
4.3	**Mbao Main Canal**	
	• Construction of check structures, 25 Nos.	33,500,000
	• Construction of turnout structures, 25 Nos.	35,228,000
	• Lining of main canal, 1.2 km long using stone masonry	80,400,000
4.4	**Flood Protection Bund**	
	• Construction of flood protection bund, 1 km long	70,350,000
4.5	**Farm service road**	
	• Construction of farm service road, 3.35 km long	156,320,000
	SUB TOTAL	**653,113,000**
	Add 10% to cover for contingencies	65,311,300
	GRAND TOTAL	**718,424,300**

5. ACTIVITIES PROPOSED FOR PHASE I CONSTRUCTION

It is important to note that activities proposed for construction in phase I of project development have been based on the feasibility study report. The total construction cost should not exceed Tshs 410 mill which has been set aside for Phase I works. The activities shall include the following:

S/NO.	DESCRIPTION	COST (Tshs)
4.1	**Diversion Headworks**	
	• Construction of diversion headworks	97,335,000
4.2	**Mahande Main Canal**	
	• Lining of main canal, 1.2 km long using stone masonry	81,730,000
	• Construction of check structures, 14 Nos.	20,216,636
	• Construction of turnout structures, 21 Nos.	22,449,000
	• Construction of road culverts, 12 Nos.	21,058,105
4.3	**Mbao Main Canal**	
	• Lining of main canal, 1.2 km long using stone masonry	80,400,000
	• Construction of check structures, 9 Nos.	12,060,000
	• Construction of turnout structures, 9 Nos.	12,682,080
4.5	**Farm service road**	
	• Construction of farm service road, 530 metres long	24,731,224
	SUB TOTAL	**372,662,046**
	Add 10% to cover for contingencies	37,266,205
	GRAND TOTAL	**409,928,250**

6. SCOPE OF WORKS

The scope of works proposed in the detailed design shall include the following:

1. Update design of the diversion headworks. The whole design will be revised in order to come up with a structure which is simple to operate by the beneficiaries and cost effective. The input of the design engineer shall be required in carrying out this activity;

2. Update design of Mahande and Mbao canals each to cover 1.2 km length

whereby slab lining option will be worked out instead of stone masonry lining because of the nature of soils that exist in the project area. This option looks to be cheaper in terms of time and the overall cost of putting it in place. The input of the design engineer shall be required in this undertaking;

3. Update design of check structures (23 Nos.) Turnouts (30 Nos.) and Road culverts (12 Nos.). The input of the design engineer shall be required to accomplish this activity;

4. Update design of Farm Service Road (530 metres long). The input of the design engineer shall be required to accomplish this activity;

5. Produce working drawings (i.e. setting out`, headworks, canals and road). The input of CAD technician or Cartographer and Design Engineer shall be required to undertake this activity;

6. Produce bills of quantities for construction of diversion headworks, canals (2.4 km length), farm road (530 metres long) and structures (checks (23 Nos.) Turnouts (30 Nos.) and Road culverts (12 Nos.)) based on the detailed design / working drawings The input of Engineer and Quantity Surveyor shall be required to accomplish this activity;

7. Produce specifications for materials and workmanship that will enable the contractor to execute the construction works and for quality control. The input of Design Engineer shall be required for this activity;

8. Compile 6 and 7 above to produce tendering documents for construction works. The input of Design Engineer and Quantity Surveyor shall be required for this activity;

9. Produce Detailed Design Report for approval, acceptance and endorsement by the district. The input of Design Engineer and typist shall be required for this activity;

Please note that:

- Structures (i.e. checks, turnouts and culverts) proposed for construction along the main canals and farm service road shall be

produced out of standard structure drawings available in our office.

- A low cost and simple diversion headworks will be considered during Detailed Design. This may create some saving that will be used otherwise.

7. EXPECTED OUTPUTS

The following outputs for phase I are expected to be out by the end of this assignment:

- Final working drawings for the construction works produced …. 3 sets;
- Tendering documents (include. Bills of quantities and engineers cost estimate for construction produced) …… 3 sets:
- Detailed design report…….. 3 sets

8. WORK PLAN

The proposed work plan for carrying out detailed design is presented in Fig 1.

9. COST OF DETAILED DESIGN

Cost for carrying out detailed design is estimated as Tshs 3,190,000/=
Detailed cost breakdown is presented in Table 1.

FIG 1: DETAILED DESIGN FOR MAHANDE IRRIGATION SCHEME IN MTO WA MBU - MONDULI DISTRICT WORK PLAN

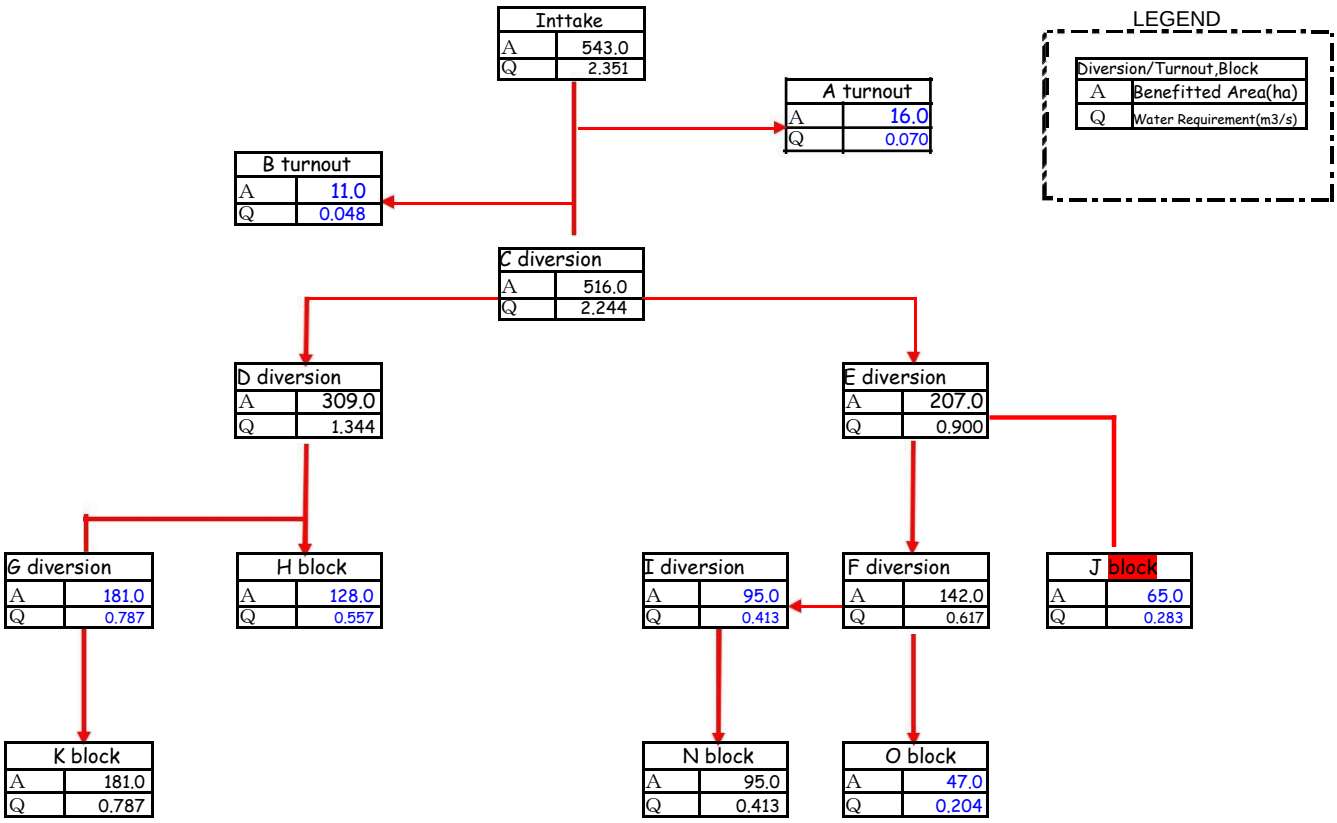
Item No.	Activity	OCTOBER 2008				NOVEMBER 2008		
		W1	W2	W3	W4	W1	W2	W3
1.	Update design of the diversion headworks							
2.	Update design Mahande and Mbao main canals, 2.4 km long							
3.	Update design of structures: i.e. checks (23 Nos.), Turnouts (30 Nos.) and Road culverts (12 Nos.)							
4.	Update design farm service road, 530 m long							
5.	Production of final working drawings							
6.	Production of bills of quantities and engineers cost estimate for the works							
7.	Production of specifications for materials and workmanship							
8.	Production of tendering documents for the construction works							
9.	Production of Detailed Design Report							

TABLE 1: COST FOR CARRYING OUT DETAILED DESIGN MAHANDE IRRIGATION SCHEME

ITEM NO.	WORK DESCRIPTION	IMPUT	NO.	UNIT (Tshs)	WORK DAYS	AMOUNT (Tshs)
1	Update design of the diversion headworks	Engineer	1 per.	41,000	5	205,000
		Technician	1 per.	30,000	1	30,000
2	Update design Mahande and Mbao main canals, 2.4 km long	Engineer	1 per.	41,000	5	205,000
		Technician	1 per.	30,000	6	180,000
3	Update design of structures: i.e. checks (23 Nos.), Turnouts (30 Nos.) and Road culverts (12 Nos.)	Engineer	1 per.	41,000	7	287,000
4	Update design farm service road, 530 m long	Engineer	1 per.	41,000	4	164,000
5	Production of final working drawings for items 1, 2, 3 and 4 above	Technician	1 per.	30,000	20	600,000
6	Production of bills of quantities and engineers cost estimate for the works	Quantity Surveyor	1 per.	41,000	12	492,000
		Technician	1 per.	30,000	4	120,000
7	Production of specifications for materials and workmanship	Engineer	1 per.	41,000	5	205,000
		Technician	1 per.	30,000	6	180,000
8	Production of tendering documents for the construction works	Engineer	1 per.	41,000	5	205,000
9	Production of Detailed Design Report	Engineer	1 per.	41,000	4	164,000
		Assistant	1 per.	20,000	2	40,000
		Binding	1 set	15,000	3	45,000
10	Stationeries	Papers A4	2 pi.	9,000	-	18,000
		Drawing Paper (A1)	2 pi.	25,000	-	50,000
TOTAL						3,190,000

Appendix 7-4 Sample of Water distribution diagram

ABC SCHEME WATER DISTRIBUTION DIAGRAM



THE UNITED REPUBLIC OF TANZANIA
PRIME MINISTER'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
MOROGORO DISTRICT COUNCIL

INVITATION FOR TENDERS
TENDER FOR
CONSTRUCTION OF MBALANGWE IRRIGATION SCHEME
TENDER No. MDC/AGRIC/09/2008/2009
21ST JANUARY 2009.

1. The Morogoro District Council has received funds from the Government of the United Republic of Tanzania under the National Irrigation Development Fund, Ministry of Water and Irrigation, and intends to utilise the funds to cover eligible payments under the Contract for the Construction of Mbalangwe Irrigation Scheme at Mbalangwe - Morogoro District - Morogoro Region. Tendering is open to all eligible and capable Tenderers

2. **The District Executive Director, P.O. Box 1880, Morogoro,** now invites sealed Tenders from reputable Contractors (Civil and Building Contractors) registered with CRB (TZ) in Class V and above for the Construction of Mbalangwe Irrigation Scheme utilising water from Msonge river.

   The major physical works to be undertaken will include the following.
   - Construction and completion of a Headwork across Msonge river.
   - Excavation and lining of a main canal with stone masonry (250 meters) and concrete slabs 2700 meters
   - Construction of structures consisting of: 7 turnouts/check structures and one culvert across the main road.
   - Production of plain concrete slabs size 450 mm x 450 mm X 50 mm

3. Interested eligible and capable Tenderers may obtain further information and Tendering documents at the office of **The District Executive Director, P. O. Box 1880 Morogoro from 8.00 a.m. to 3.30 p.m. local time on Mondays to Fridays inclusive, except on public holidays.** Mbalangwe Irrigation Scheme itself is located in Tununguo Ward about 85 km from Morogoro Municipal Council towards Morogoro - Matombo – Mvuha Road, Morogoro District in Morogoro Region.

4. The client will provide transport for site visit which will be held on **5th February 2009 at 8.00 am.**

5. Also, interested eligible and capable Tenderers should submit full details of their Offices or Company's profiles, photocopies of valid trading licences, Contractor's Registration Board Certificates, Certificates of Incorporation, Current receipt of annual subscription fee from the contractor registration board, VAT or TIN Registration Certificates, Power of Attorney and any other relevant information required by the Tendering documents.

6. Tenderers are required to fill in rates and prices for all items of works described in the Bills of Quantities. All duties, taxes, and other levies payable by the Contractor under the contract, or for any other cause must be included in the rates, prices and total Tender Prices in the Tenders submitted by the Tenderers.

7. A complete set of tendering documents may be purchased by the interested Tenderers upon payment of a non-refundable fee of Tsh 100,000 [Tanzania Shillings One hundred Thousand Only] in cash to **The District Executive Director, P. O. Box 1880 Morogoro.** Further information can be obtained from the same office at The District Agriculture Office – Irrigation Section in Morogoro District Council.

8. All Tenders shall be submitted in English. One original plus two (2) copies of the original properly filled in and enclosed in plain sealed envelope and must be accompanied with an original Tender securing declaration in acceptable form. All Tenders and Tender securing declaration shall be valid for a period of 90 days after Tender opening. All Tenders and the Original Tender securing declaration must either be delivered by hand or be sent by registered post so as to reach The Secretary, District Council **Tender Board , P. O. Box 1880 Morogoro District Council on or before 12.00 noon** local time on, **20th February, 2009.**

9. Tenders will be opened in public and in the presence of the Tenderers' representatives who choose to attend Tender opening session at Morogoro District Council office. Tenders sent by post must be registered. The outer envelope must be clearly marked:

   "TENDER FOR CONSTRUCTION OF MBALANGWE IRRIGATION SCHEME IN MOROGORO DISTRICT: TENDER No. MDC/AGRIC/09/2008/2009. DO NOT OPEN BEFORE 12.00 NOON LOCAL TIME ON **20th FEBRUARY, 2009**

   If the outer envelope is not sealed and marked as above, the Client will assume no responsibility for the misplacement or premature opening of the Tender.

10. Tenders not received, not opened and not read in public at the opening ceremony shall not be considered for evaluation irrespective of the circumstances. Telegraphic, telex, telefax and late non-telegraphic or telex and telefax or portion or any Tender shall not be accepted.

11. The client is not obliged to accept the lowest tender or any tender which does not qualify or abide to the client requirements.

THE SECRETARY,
MOROGORO DISTRICT COUNCIL TENDER BOARD
P.O BOX 1880,
MOROGORO.

00817920

MONDULI DISTRICT COUNCIL

TENDER NO.MDC/7/08/09

INVITATION FOR BIDS

INVITATION DATE 15TH DECEMBER 2008

1.0 The District Executive Director, Monduli District Council (hereinafter called "The Employer") has received funds from The Government of the United Republic of Tanzania and Donor Agencies (hereinafter called "financier") towards the cost of implementation of DADP Projects and intends to apply part of the funds to cover the eligible payments under the Contract for Rehabilitation of Mahande Irrigation Scheme, in Baraboroni village-Monduli District.

Bidding is open to all bidders and will be conducted through National Competitive Bidding as defined in the Public Procurement Act of 2004 and Regulations of 2005.

2.0 Monduli District Council now invites sealed bids from Eligible Contractors fully registered with Civil Engineering and Building Contractors Registration Board Class Seven (VII) and above for the Rehabilitation of Mahande Irrigation Scheme in Baraboroni Village in Mto wa Mbu Ward Monduli District which shall comprise of the following works:

i. Construction of Mto wa Mbu river Diversion Headworks comprising of reinforced concrete River Cross structure and River Training works.
ii. Construction of Mahande and Mbaa main canals comprising of Precast concrete slab lining (2.4 km long), Construction of Check structures (23 nos), construction of turnout structures (30 nos), Construction of Road culverts (6 nos).
iii. Construction of farm Service Road (530 m) with basic quantities as stripping (2,200 m ^{2}) compacted fill (1,000 m3) and Murram (330 m ^{3})

3.0 Interested eligible bidders may obtain further information from and inspect the bidding documents at the office of the District Executive Director, Monduli at the address given below from 08.00-15.30 hours local time from Monday to Fridays inclusive except on Public Holidays.

4.0 A complete set of Bidding Documents may be purchased by interested bidders on the submission of a written application to the address below and upon payment of a non-refundable fee of Tsh. 50,000/= (Fifty Thousand Shillings only) The method of payment will be by cash or bankers cheque to the District Executive Director, Monduli. The document will be issued upon payment.

5.0 Tenders shall be valid for the period of 90 days after tender Opening and must be accompanied by security of not less than 2 percent of the tender price in Tanzania shillings. Tenders shall be delivered to The District Executive Director's office on or before 11:00HRS a.m on 03/02/2009, at which time they will be opened in presence of the Tenderers or their representative who wish to attend. Tenders sent by post must be registered. The outer envelop must be clearly marked

"TENDER FOR REHABILITATION OF MAHANDE IRRIGATION SCHEME IN MONDULI"
TENDER NO. MDC/7/08/09 OF 15/12/2008/2009
DO NOT OPEN BEFORE 11:00HRS A.M ON 03/02/2009

If the outer envelop is not sealed and marked as above, the Employer will assume no responsibility for the misplacement or premature opening of the Tender.

6.0 Tenders not received, not opened and read in at the opening ceremony shall not be considered for evaluation irrespective of circumstances. Telegraphic, telex, telefax and late non-telegraphic or telex and telefax or portion of any Tender shall not be accepted.

7.0 Site Visit is compulsory. Free guided site visit will be held after request by the bidder to the District Executive Director's Office. Each bidder will visit the site at his/her own cost.

CYPRIAN OYIER
DISTRICT EXECUTIVE DIRECTOR
MONDULI

The District Executive Director,
Monduli District Council,
P.O.Box 1,
Monduli Arusha
Tel: +255272538005/6
Fax: +255272538136

COMPOSITION OF TENDER DOCUMENTS

SECTION I:	**INVITATION FOR TENDERS**
SECTION II:	**INSTRUCTION TO TENDERERS (ITT)**
SECTION III:	**CONDITIONS OF CONTRACT**
SECTION IV:	**STANDARD FORMS**
SECTION V:	**TENDER DATA SHEET**
SECTION VI:	**CONTRACT DATA**
SECTION VII:	**TECHNICAL SPECIFICATIONS**
SECTION VIII:	**DRAWINGS**
SECTION IX:	**BILL OF QUANTITIES**
SECTION X:	**UNDERTAKING BY TENDER ON ANTI-BRIBERY POLICY/CODE OF CONDUCT AND COMPLIANCE PROGRAM**

These contents are based on "Procurement of Works / Standard Tendering Document (Ministry of Finance)".
Each section's main contents are shown as below.

SECTION I: INVITATION FOR TENDERS

SECTION II: INSTRUCTION TO TENDERERS (ITT)

Table of Contents

Notes on Conditions of Contract

The Conditions of Contract, read in conjunction with the **Contract Data** and other documents listed therein, should be a complete document expressing fairly the rights and obligations of both parties.

The form of Conditions of Contract that follows has been developed on the basis of considerable international experience in the drafting and management of contracts, bearing in mind a trend in the construction industry towards simpler, more straightforward language.

The form can be used directly for smaller admeasurements contracts and, with the modifications noted in the footnotes, it can be adapted for lump sum contracts. The use of standard Conditions of Contract for building and civil works in a country will promote comprehensiveness of coverage, general acceptability of its provisions, savings in cost and time in Tender preparation and review, and the development of a solid background of legal case histories.

Table of Clauses

4.2 Performance Bank Guarantee (Unconditional) ...

4.3 Bank guarantee for advance payment ...

4.4 Tender Security (Bank Guarantee) ...

4.5 Agreement ...

4.6 Contractor's Tender ...

4.7 Letter of Acceptance ...

SECTION V: TENDER DATA SHEET

Instructions to Tenderers Clause Reference (IFT)

(3.2) (a) The minimum required annual volume of construction works for the successful tenderer in any of the last two years shall be: Tshs three hundred million (300,000,000/=)

(a) Experience as prime contractor in the construction of at least one work of a nature and complexity equivalent to the Works the last 2 years (to comply with this requirement, works cited should be at least 70 percent complete)

(b) The essential equipment to be made available for the Contract by the successful tenderer (proposals for timely acquisition or own, lease, hire, etc) shall be;

(i) Two (2) 7 ton or greater capacity tipper trucks (ii)

(iii) One (1) self propelled vibrating drum earthworks compactor

(iv) One (1) concrete mixer of 350 litres minimum capacity

(v) One (1) Bulldozer;

(vi) One (1) Water bowser truck

(vii) One (1) Wheel loader

(c) A Project Manager with two years experience in works of an equivalent nature and volume.

(12.4) The contract is not subject to price adjustment in accordance with Clause 11 of the Conditions of Contract.

(13.1) The currency in which the prices shall be quoted shall be: Tanzania shillings.

(13.2) The authority for establishing the rates of exchange shall be Bank of Tanzania.

(14.1) The period of tender validity shall be ninety (90) days after the deadline for bid submission specified in this **Tender Data Sheet**.

(15.1) The number of copies of the tender to be completed and returned shall be: three.

(16.2a) The employer's address for the purpose of tender submission is:
Secretary, Council Tender Board, P.O. Box 1, Monduli

(16.2b) The name and identification number of the Contract is: Rehabilitation of Mahande Irrigation scheme, Contract No. _____

(17.1 & 20.1) The deadline for submission of tenders shall be_____ and Tenders shall be opened at_____ on the same date and address.

(30.1) The Advance Payment shall be limited to ten (10) percent of the Contract Price.

SECTION VI: CONTRACT DATA

SECTION VII: TECHNICAL SPECIFICATIONS

Table of Clauses

PART 2 EARTH WORKS ...

201 Site Clearance ...
202 Surface Levels ...
203 Definition of Earthworks Materials ...
204 Removal of Unsuitable Material...
205 Excavation General ...
206 Blasting ...
207 Excavation beyond Line or Level ...
208 Approval of Excavation ...
209 Excavation for Structures...
210 Excavation for Fill Foundations ...
211 Trench Excavation ...
212 Channel Excavation ...
213 Disposal of Excavated Material ...
214 Spoil Tips...
215 Borrow Pits and Quarries ...
216 Earth Filling ...
217 Backfilling of Structural Excavations ...
218 Filling under Raised Foundations ... Slopes
219 and Batters ...
220 Frequency of Testing ...

PART 3 CONCRETE...

301 Concrete General ...
302 Cement ...
303 Cement Testing ...
304 Storage of Cement ...
305 Fine Aggregate ...
306 Coarse Aggregate...
307 Water for Concrete ...
308 Steel for Reinforced Concrete ...
309 Concrete Classes ...
310 Concrete Mix Designs ...
311 Works Test ...
312 Test Failure ...
313 Workability ...
314 Consistency ...
315 Concrete Returns and Records ...
316 Batching ...

SECTION IX: BILLS OF QUANTITIES

Table of Contents

SECTION X: UNDERTAKING BY TENDER ON ANTI-BRIBERY POLICY/CODE OF CONDUCT AND COMPLIANCE PROGRAM

Files of "Procurement of Works / Standard Tendering Document (Ministry of Finance)" are put in attached CD as a reference data 3-1.

MONDULI DISTRICT COUNCIL

Tender Evaluation Report
and
Recommendation for Award of Contract
Tender Number MDC/7/08/09 of 2008

Name of Project:	**Rehabilitation of Mahande Irrigation Scheme**
Identification Number:	**MDC/7/08/09**
Date of Submission:	**February, 2009**

FEBRUARY 2009

MONDULI DISTRICT COUNCIL

All correspondence to be addressed to:
District Executive Director,
Tel No. 027- 2538006/2538005,
Fax No. 027- 2538136,
E-mail: ded@mondulidistrict.go.tz

P.O. Box. 1,
MONDULI.
ARUSHA.

10 February 2009

DISTRICT EXECUTIVE DIRECTOR
P.O. Box 1
Monduli (***Attn: Secretary, Council Tender Board***)

Dear Sir,

PROJECT:**REHABILITATION OF MAHANDE IRRIGATION SCHEME**
TENDER NO. MDC/7/08/09 OF 2008

SUBJECT: **SUBMISSION OF TENDER EVALUATION REPORT**

Reference is made to the above subject matter.

Please find enclosed Tender Evaluation Report - Tender No. MDC/7/08/09 of 2008 for the Rehabilitation of Mahande Irrigation Scheme.

The Invitation for Tenders and opening were processed through the Council Tender Board (DCTB). Tendering process involved post-qualification of Tenderers.

In the Tendering process, the Tender submission deadline was set at 11:00 a.m. on Tuesday 03 February 2009 and no extensions were granted. A total of 7 Tenders were received and opened at 11:00 a.m. on the same day.

The Evaluation of Tenders was carried out jointly by a team comprising of staff from Zonal Irrigation Unit – Kilimanjaro and the Monduli District Council in accordance with the PPRA guidelines "Procurement of Works or Goods" of February 2007. Standard Forms for the Evaluation were used as per PPRA Tender Evaluation Guidelines.

Clarifications were sought from the Tenderers as regard to whether the rates, amounts and Tender Prices in their Tenders were 20% VAT inclusive or not. Copies of the letters sent to the Tenderers and the response received from the Tenderers are appended as Appendix E in the Tender Evaluation Report.

SUMMARY OF FINDINGS

A brief summary of the Evaluation conclusions is presented below:

Invitation for Tenders

Invitation to Tenderers for the Rehabilitation of Mahande Irrigation Scheme was advertised in the Mwananchi Newspaper of Monday, 29th December 2008.

Tender Evaluation Procedure

In the Tendering process, Eight (8) construction firms purchased the Tendering Documents. However, seven of them submitted their Tenders. The Evaluation of Tenders received is presented in the Tender Evaluation Report.

The Evaluation of Tenders was carried out in accordance with the PPRA "Tender Evaluation Guidelines for Procurement of Works or Goods" of February 2007. Standard Forms for the Evaluation were used. Preliminary Evaluation followed by a Detailed Evaluation of the Tenderers who passed the Prelimminary Evaluation. The last stage was to Post-qualify the Lowest Evaluated Tenderer. The summary information of various Evaluation Stages is presented in the Tender Evaluation Tables included in Appendix A of the Evaluation Report.

Preliminary Evaluation of Tenders

The Preliminary Evaluation of information in the Tenders was carried out in strict compliance with the PPRA guidelines and had taken account of the following criteria.

- Verification
- Eligibility
- Tender Security
- Completeness of Tender
- Substantial Responsiveness

Each Tenderer was evaluated through the above stages and the summary information / results are presented in Table 5 of Appendix A in the Evaluation Report.

Three tenders out of seven were found to be substantially responsive and progressed to the Detailed Evaluation Stage. These were tenders of M/s Naisho Construction / Befra construction Joint Venture, APE Engineers Services and M/s Kashere Enterprises.

Detailed Evaluation of Tenders

The Detailed Evaluation of Tenders comprised of the following steps according to the guidelines:

- Corrections for errors
- Corrections for Provisional Sums
- Modifications and Discounts
- Evaluation Currency
- Additions
- Adjustments
- Priced Deviations
- Recommendation for award of contract

- Arithmetic errors were corrected in accordance with Clause 24 of the instructions to Tenderers. No arithmetic errors were identified for all three tenders qualified for Detailed Evaluation.

Summary information of the Detailed Evaluation in accordance with the PPRA format is presented in Standard Tables - Appendix A in the Evaluation Report.

The Tenders which qualified for Post-qualification are shown in the table below:

Rank	Tenderer	Tender Price	Remarks
1	Naisho / Befra Joint Venture	260,675,360.00	Below Engineers estimate by 2.7%
2	APE Engineers Servises	277,815,560.00	Above Engineers estimate by 3.6%
3	Kashere Enterprises	340,590,415.00	Above Engineers estimate by 27.1%

The Engineer's Estimate including taxes and 10% for contingencies is Tshs 268,038,100.00.

Post-qualification Examination

Since the pre-qualification of Tenderers was not done due to time constraint, the Tenderer who offered the Lowest Evaluated Tender Price was subjected to Post-qualification Evaluation. The Post-qualification requirements that were followed are those given in Clause 3 of the Instructions to Tenderers.

In the event that the Lowest Evaluated Tenderer fails the Post-qualification, his Tender is rejected and the next ranked Lowest Evaluated Tenderer is selected and his Tender subjected to Post-qualification Evaluation. If successful, this Tenderer should receive the award. If not the process continues (ref. paragraph 17 (c) of the PPRA Tender Evaluation Guidelines for "Procurement of Works or Goods"

The post-qualification information supplied by the Lowest Evaluated Tenderer (i.e. M/s Naisho/Befra JV was examined strictly in accordance with the Post-qualification requirements. The assessment was carried out using the following criteria:

(i) **General Information:** (Written Power of Attorney, Business Licence, Signed Form of Tender, CRB Certificate of Registration and Class, VAT and TIN Registration Certificates); *Section IV of the Instructions to Tenderers*

(ii) **Relevant Firm experience:** (Annual minimum requirement over the last 2 years equivalent to Tshs 300 million, Successful experience as Prime contractor in the execution of at least one work of similar nature and complexity equivalent to the works over the last 2 years); *Sub-clause 3.2(a) of the Tendering Data*

(iii) **Personnel Capabilities:** (A Project Manager with 2 years experience in works of an equivalent nature and volume.); *Sub-clause 3.2(c) of the Tendering Data.*

(iv) **Contractor's Equipment:** (A minimum of 2 Nos. seven ton or greater capacity trucks, 1 No. hydraulic excavator, 1 No. self propelled vibrating drum earthworks compactor, 1 Nos. concrete mixers of 350 litres minimum capacity, 1 No. Bulldozer, 1 No Water bowser truck and 1 No Wheel Loader); *Sub-clause 3.2(b) of the Tendering Data*

In the post-qualification assessment M/s Naisho/Befra JV failed to qualify and their tender was rejected. The process of post-qualification proceeded with the tender of M/s APE Engineers Services which qualified.

The detailed assessment of post qualification for M/s Naisho/Befra JV and M/s APE Engineers Services is presented in Appendix C of the Evaluation Report.

Recommendation for Award of Contract

The tender submitted by M/s APE Engineers Services was found to be the lowest evaluated tender to the amount of Tshs. 277,815,560.00 (including 10% contingencies).

We hereby recommend that the contract for Rehabilitation of Mahande Irrigation Scheme be awarded to M/s APE Engineers Services in the amount of **Tshs 277,815,560.00 (Shillings Two Hundred Seventy Seven Million Eight Hundred Fifteen Thousand Five hundred sixty only)** including 10% for contingencies. The amounts breakdown for each Bill is shown in the Table below.

The amounts breakdown for each Bill

Bill No.	Description	Amount (Tshs)
Bill 1	Diversion Headworks	76,820,000.00
Bill 2	Mahande Main Canal	102,573,600.00
Bill 3	Mbao Main Canal	49,072,000.00
Bill 4	Farm Service Road	24,094,000.00
	Add 10% contingencies	25,255,960.00
	Proposed Contract Award	**277,815,560.00**

Yours Sincerely,

.....

Eng. M. E. Kessi

Chairman
TENDER EVALUATION TEAM

MONDULI DISTRICT COUNCIL

Ref.NO... March 2009

MANAGING DIRECTOR
Xyz Construction Co Ltd
P.O. Box
IRINGA

Dear Sir,

PROJECT: **REHABILITATION OF MAHANDE IRRIGATION SCHEME**
TENDER NO. MDC/7/08/09 OF 2008

SUBJECT: **LETTER OF ACCEPTANCE FOR AWARD OF CONTRACT FOR REHABILITATION OF MAHANDE IRRIGATION SCHEME**

Reference is made to the above subject matter.

We hereby notify you that your Tender for Rehabilitation of Mahande Irrigation Scheme, Tender No. MDC/7/08/09 OF 2008 for the Contract Price of Tshs xxxx0.00 (Shillings xxxxx only) including 20% for Value Added Tax as corrected in accordance with Clause 24 of the Instructions to Tenderers has been accepted.

You are hereby instructed to proceed with the execution of the said works, subject to the following conditions.

(a) Receipt of your Unconditional Letter of Acceptance of our offer within 7 days of receiving this letter;

(b) Provision of Contract Performance Security to the District Executive Director, P.O. Box 1, Monduli,

(c) Signing of the Contract Agreement between you and the District Executive Director, P.O. Box 1, Monduli

Summary of the Contract Price in terms of Bills of Quantities is shown in the Table below.

Bill No.	Description	Amount (TShs)
Bill1	Diversion Headworks	
Bill2	Mahande Main Canal	
Bill3	Mbao Main Canal	
Bill4	Farm Service Road	
	Add 20% VAT	
	Proposed Contract Award	

2. PERFORMANCE SECURITY

In accordance with Clause 52 of Conditions of Contract, you are required to deliver to the District Executive Director, P.O. Box 1, Monduli a Performance Security for the minimum amount equivalent as a percentage of the Contract Price within 21 days after receipt of this letter:

(i) Unconditional Bank Guarantee of Ten (10) Percent of the Contract Price.

The standard form of the Performance Security acceptable to the Employer was attached in the Tender Documents.

3. INSURANCEs

You are also required to deliver the necessary Insurances specified in the Contract Data (Clause 13).

4. START DATE

The Start Date shall be not later than **Is** days after receipt by the District Executive Diivctor P.O. Box 1, Monduli of a valid and approved Performance Security or not latter than 30 days after receipt by you of this letter.

(Name)

DISTRICT EXECUTIVE
DIRECTOR MONDULI
DISTRICT COUNCIL
MONDULI

Copy to: Zonal Irrigation Engineer
Kilimanjaro zone
P.O. Box
1843 MOSHI

I. Construction Work Plan

1. Construction plan and items to be kept in mind

The natural conditions such as topography, soil and water in project areas, which affects the construction progress, should be precisely surveyed prior to the main construction work. The construction plan is to be established so that the project is carried out safely and completed within the specified time and cost.

The plan should be decided concretely considering the quality, the contract period, the economical efficiency, etc. such as what kind of materials and machines should be used, what kind of execution method should be adapted for the work.

Table 1-1. Construction plan in implementation period

Items	work
Decision of construction period	As for the construction by machines, the bad weather conditions in rainy season shall be avoided so as to improve a networking rate of the machines and also to preserve quality of works.
Construction Conditions	As for the area at valley bottom and ill-drained field, the main drainage canal and temporary drain shall be constructed prior to the actual construction in order to keep the field dry.
Relations to the farming	Rice planting has been done around the area, the appropriate consideration is necessary for conveyance of the water to the farm and the drainage.
Plan for labor and material	The Contract should be signed at an early stage so as to have enough time for completion of the works.

Table 1-2. The items to be kept in mind when a construction plan is formulated

Items	Content
Scale of construction	As for the work with short term construction period, the ability of constructor shall be considered carefully so as that the works to be completed within the Contract period.
Communication among the district, irrigators' organization, etc	Explanatory meeting to the irrigators' organization, etc. at the site, shall be held in order to explain the time to start surveying and full-scale construction, and to try to get an understanding of harvesting of crops at an early, and of removing obstacles for starting the construction as soon as possible.
Precedence in main drainage canal work	The main drainage canal work shall be executed prior to the other works. It's necessary to keep field dry all the time by removing the rainwater promptly. Besides the sedimentation pond shall be provided at outlet to the river if necessary so as to minimize the influence of sediments to the downstream area.
Temporary drainage	Temporary drainage canal in the area where there is a lot of spring water and

canal work and drainage work in field	underground water shall be provided so as to remove the stagnant water on field and to maintain the bearing capacity of soil.
Precedence in main road construction work	A highway should be constructed prior to other construction works in order to make the materials transport easily.
Adjustment of the other projects	The project is constructed in the extension area. There might be several facilities that are related with other organizations concerned. in that case, discussion with them have to be made.

2. Temporary works planning

When the work is implemented, the following points shall be kept in mind concerning temporary works.

Table 2-1. Temporary work

Content of temporary work	The items to be kept in mind	Discussion with the persons concerned
1. Temporary drainage canal	As a principle, temporary drainage canal shall be constructed without lining section. Even if we use the prefabricated products due to velocity and discharge, etc, the standard products shall be used, which are available for relocation to the main construction works. Besides, the temporary drainage canal in the project area should be constructed at the same position in the planning line as much as possible.	When the temporary drainage canal is constructed on the outside of the construction area, discussion on the compensation, water management, etc, with the people concerned may be required.
2. Temporary irrigation canal	It's the same as mentioned above.	Same as mentioned above.

3. Temporary road (Detour)	♉ In case of temporary road, it often connects with the important main road. Therefore, stable materials shall be used for building the road and attentions to the traffic safety have to be paid. If necessary, setting up a road sign and a safety fence shall be considered. Besides, repair materials shall be considered in accordance with importance of its road. ♉ In case of a detour, the construction of such road shall be constructed at beginning stage as a precedence work, and the detour may be used during main construction stage.	The early discussion shall be made on the construction period, preparatory plan, execution method, etc. with authority concerned so as not the construction schedule changed by its permission.

3. Work Schedule

The work schedule should be prepared with the work procedures and the daily schedule, which is consist of the sequences of each component work, based on the basic policy of the execution way and execution sequences which are appropriate for site condition.

In the process, the scheduling concerning the use of labor force, material, and equipment should be carefully considered.

When we make the work schedule, in addition to the overall work schedule above mentioned, the partial work schedule relating to the special important progress shall be made prior to process of the overall work.

The points that shall be kept in mind for making the schedule are as follows.

(1) The schedule giving priority to the main work shall be made.

(2) Interrelation among the construction works such as if there is the works precedent to the work or, if there is a possibility for parallel work or, the diversion of a construction machine to other work and so on shall be clarified.

(3) Priority shall be given to the work which takes a long term from start to completion so as to start at early stage. Especially, the embankment work on poor ground shall be carried out at early stage, since a consolidation of the ground might happen.

3-1. Types and characteristics of the work schedule

Bar-chart, Line-chart and Network, are generally used for progress control at present. These methods are not only use for time control, but also it is important to make these Bar-chart, Line-chart and Network use for the control efficiently with product elements (labor force, setting machines, materials, etc). Their advantage and disadvantage are as follows.

Table 3-1. Advantage and Disadvantage per controlling type

Type	Advantages	Disadvantages
Bar chart	a. It is easy to make it. b. It can identify the progress condition promptly. c. It is easy to modify it.	a. The correlation of each work is not so clear. b. In the case of partially change in the work, it is difficult to find the influence over the total work c. It is easy to include fuzzy elements.
Line chart	a. In case of the progress is expressed by simple unit such as tunnel work which can show the progress as length, it can express all work type in the frame. b. It can identify a misalignment of the work sequence and the schedule promptly c. It can identity the execution place and the progress of construction period.	a. The correlation of each work type is not so clear. b. In the case of partially change in the work, it is difficult to find the influence over the total work c. It is easy to put fuzzy elements. However, If it is used with Bar char, this point is dissolved partly.
Net work	a. The correlation of each work is clear. b. In the case of partially change in the works; it is easy to find the influence over the total work quantitatively. c. It is appropriate to use for total control of complicated project. d. It can control the project with an emphasis on important work.	a. It needs more time to make it. b. It takes time to understand the method. c. It is difficult to form the network. d. It is difficult to modify it comparatively.

3-2. the calculation of construction period

1) The calculation of total construction period

Total construction period = Operation days + Impossible work days + Days of Holiday + Days for preparation and clean-up

Fig. 4-1 Example of Work schedule

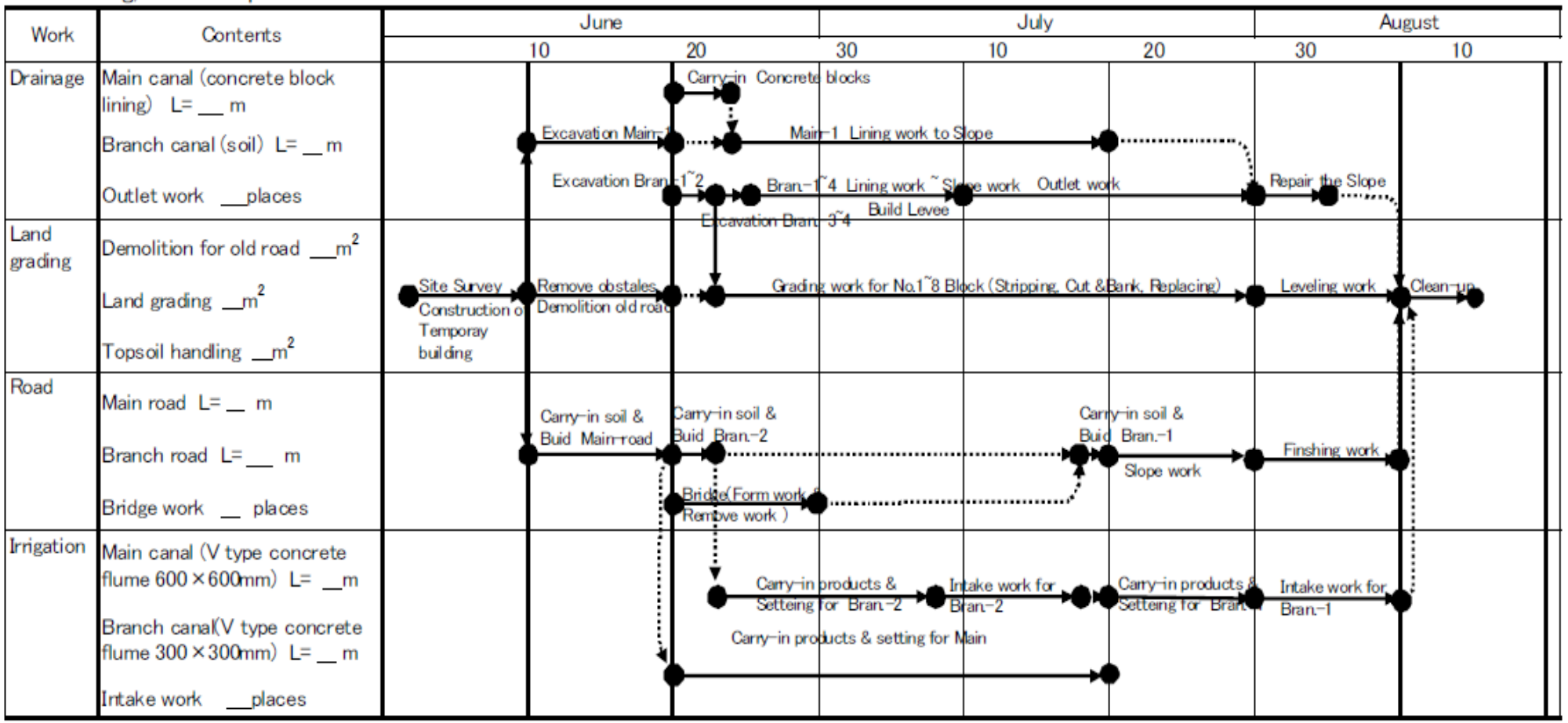


Table3.1: Summary of Results for Duration of works by manpower

Activity	Unit	Quantity	Task Rate/ Person Day	Number of Workers	Duration Days (weeks)
Site clearance	m2	49200	90m2	15	36.4(6)
Form up Road					
a) Ditching & Slopping	m	12400	5.70m	30	72.5(12)
b) Camber formation	m2	36000	60m2	10	60(12)
Gravelling					
a) Excavation & Stockpiling	m3	4750	2.5m3	30	63.3(11)
b) loading	m3	4750	5.0m3	15	63.3(11)
c) Spreading	m2	36000	50m2	10	72(12)
Culverts	No	6	0.013No.	10	46.2(8)
Earthworks	m3	1200	2.5m3	10	40(7)
Scour check	No	250	1 No.	6	41.6(7)

Summary of quantities. equipment and their output

S/No	Activity	Quantity	Equipment	Output	No. of equipment	Duration in days	Remarks
1	Site clearance & earthworks	16,OOO	Dozer	16,OOOm2/ day	1	2	Heavy ground condition
2	Earthworks	500m3	Tipper	4.5m3/1Tip	1	5	
3	Road formation	2OOOm	Grader	500m/day	1	4	Including all drains
4	Road formation: Watering		W/dozer	500m/day	1	8	
5	Road formation: compaction		P/roller	300m/day	2	7	
6	G.excavation	2040m3	Dozer	2040m3	1	10	
7	Gravel loading	2040m3	Loader	1.5m3/1ift	1	5	Depend on haulage capacity
8	Gravel hauling	2040m3	Trucks	4.5m3/1Tip	3	5	Assumed average distance of 1 km
9	Gravel spreading		Grader	500m/day	1	8	
10	Gravel watering		W/dozer	500m/dav	2	7	
11	Gravel compaction		P/roller	300m/day	1	8	

Appendix 9-3　Construction management

1. Construction management

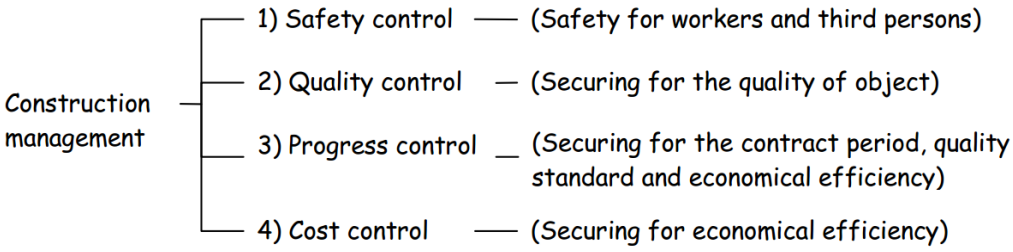
1-1. Construction management

The contractor shall complete the work within the prescribed term within the contract, and hands over completed structures to the employer.

The contractor shall finish the construction work in accordance with the following condition

① Safety construction
② To make it with good quality
③ Within the term of construction as fast as possible
④ At the cheap price as much as possible

Construction management is divided into following controls.



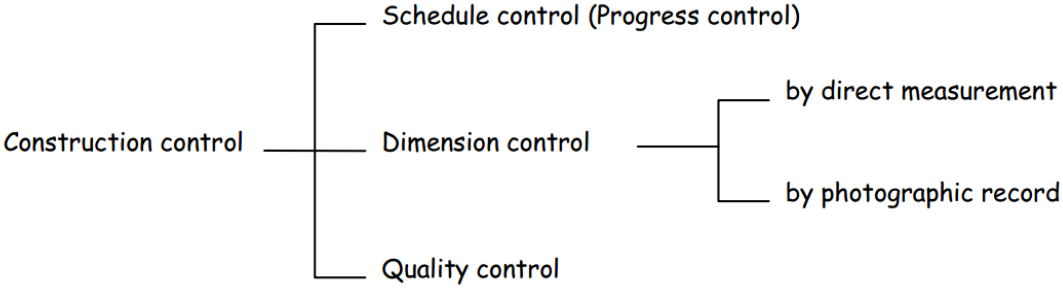
These controls of safety, quality, progress of work and the cost are defined as 4 important control elements for construction management.

1-2. The method of Construction management

Construction management is to manage the progress, the final figures and the quality of construction work with checking the construction plan in order to complete the object, which was indicated in the contract, specifications and design drawing, within the required periods economically.

A person in charge of construction management has to understand the control standard, specifications, drawing and special specifications well, and do the proper management with confirming every work respectively.

And he shall has to keep record of discussion, order or request at the site inspections or meetings on record of meeting as shown in form 9-2-1, for the mutual-possession of information among parties concerned.



1) Progress control

Progress control is a management of work process to check if the work is going well at the proper speed during the periods in good quality and with accuracy.

When the delay of process happens because of extraordinary weather or unexpected obstacle, the plan should be re-examined with specific measurements, such as strengthening the execution formation and extending the work time, etc, and an alternation of plan should be established in order to recover the delay, so that we adjust to achieve the expected purpose.

The work schedule shall be established after deciding construction plan of each unit work and work process based on the basic policy of suitable construction method for the site and the orders of construction.

A progress chart of each kind work will be made and used as a standard of action and control. In this case, bar chart or network is used as a form of the progress chart, but when the work becomes large-scale and complicated, it comes to be difficult to manage it by a bar chart method. Then it's necessary to adapt a network method.

As for the progress control, it's necessary to make it a habit to fill the percentage of work completion in the progress chart on a regular basis, daily, weekly or monthly, and to check the progress whether the work is as is planned or is behind the schedule all the time. And, by the result of progress, when the delay of a schedule turns out to be clear, the contractor has to take an action so that the work will be completed within the contracted period with revising the work schedule again.

Since the work process becomes a factor of changing the contract occasionally, it's important to control the work considering the relations between the weather factor and physical factor.

2) Dimension control

Dimension control is to judge directly or indirectly how degree the completed structure is constructed in its accuracy compared with the design papers.

It is necessary to precede the work by checking at a time when a part of structure is completed. And also it's necessary to submit a daily report of construction and a control chart

on the way to be under the construction. Especially the control chart at the interim inspection should be checked without fail.

The employer always calls contractor's attention to whether the structure is constructed under the good control or not.

There are two control methods ; (i) by direct measurement and (ii) by photograph record.

(a) Dimension control by direct measurement

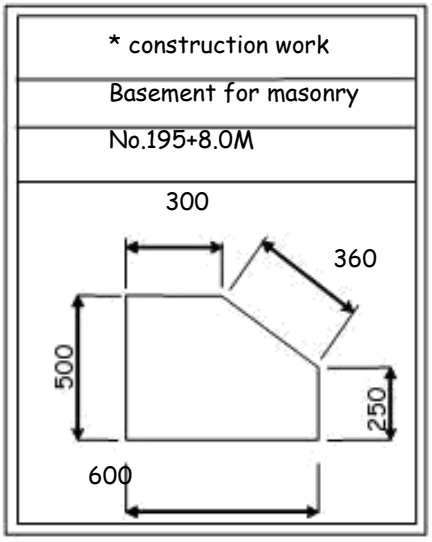
It will be done based on "tolerance " indicated by the employer. Supervisor have to manage the dispersion degree against the standard values by comparing the designed values with the actual measured values, record these results and write down them in control diagram, results table or the values written in red on design drawing. A sample of results table is shown in Table 9-2-1

(b) Dimension control by photo records

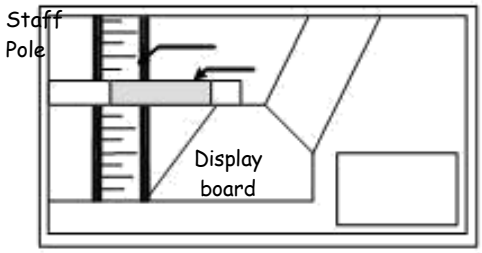
This is the method to confirm the materials, conditions and situation, such as the confirmation data for the result of the parts where can't be confirmed from outside and by execution records after completion of work, the construction way of each construction stages, the discrepancies between the design and the actual, kinds of construction machines, construction method of the temporary work, safety management and so on by photos.

When taking photos and arranging them, it's important to indicate dimensions with scale and the necessary items and comments on a blackboard.

An example for display board



An example of photograph



3) Quality control

The purpose of quality control is to build the structures, which satisfy the standard value indicated in the design and specifications. And it is also, to prevent the defects from happening, and to increase the reliability of the construction work.

When poor quality is found in the work, it takes a lot of money, time and trouble in order to improve it. A physical, chemical and dynamic test in order to satisfy the specification and quality of constructing objects indicated in contract shall be done. And in each case of tests, the results have to be recorded in the designated control chart or results table so that we should always manage the work to be managed more properly in order to prevent the defects. The basic points to be kept in mind in the construction management are as follows.

a) The contractor carry out the construction management promptly, report the results to the supervisory staff, and obtain their confirmation.
b) Special attention shall be paid to the invisible spots after completion of work or the parts difficult to measure after completion.
c) At the beginning of the construction management, the frequency of measurement shall be increased, if necessary, regardless of the measurement standard.
d) As for the completion inspection and partial inspection, the contractor shall arrange the control chart or the results table, etc .

1-2. Control Management Standard

The followings are the control management standards specified in the standard specification set by the PPRA.

The following are the tolerances within which the works are to be executed or as directed by the Project Manager:

EARTHWORKS

Top level of Embankments after compaction	+100/ -0 mm	
Sides of Embankments over a 10 m length	+100/ -0 mm	
Channel or Excavation cutting	+20/ -20 mm	
Channel Water Way Area	-0	
Horizontal Alignment of Channels	Maximum	300 mm
	Over 20 m length	100mm
Formation Level for Structures	+0/ Refilled with concrete	
Formation Level for Gabions	+0/ -100 mm	

CONCRETE STRUCTURES

The following tolerances shall apply to all wrought formed and fair or fine unformed finishes.

Tolerance from Specified Position

Maximum departure of plan position of structure 150 mm

Tolerance from Specified Dimension

Maximum departure in thickness, cross-sectional

dimension or position of columns, beams, walls, footings and the like	+25/ -10 mm

Surface Tolerance on Straightness or Departure from Specified Curve

General Surfaces

Maximum deviation in horizontal or vertical direction

• gradual over a 10m length	25 mm
• Abrupt	10 mm

Surfaces in Contact with Flowing Water

Maximum deviation in direction of flow or normal to flow

• Gradual over a 10m length	15 mm
• Abrupt	5 mm

Reinforcement

Maximum departure in required spacing	15 mm
Minimum lap length shall be:	
- In the case of mild steel reinforcing	40 times bar diameter
- In the case of high yield steel reinforcing	50 times bar diameter
Stonework	+100/ -25 mm
Pitching and Masonry over a 2 m length	+ 75/ -25 mm +100/ - 0 mm
Face of gabion basket	
Thickness of tipped rock or filter layer	

Quality control standard

The followings are the quality control standards specified in the standard specification for earth filling work and concrete works by the PPRA.

As for earth filling works, prior to the works, compaction test for the fill materials should be carried out in order to get optimum moisture content which gives maximum dry density of the material.

Then, the trial embankment shall be conducted using the same compactor which to be used for the earth filling work, in order to get necessary number of passing of compactor so as to meet the requirement of the specification.

Earth Filling

(1) Fill shall be placed in layers not exceeding 150 mm compacted thickness, each layer being scarified and thoroughly compacted to obtain a dry density not less than ninety five per cent (95%) of the Proctor maximum dry density as determined by Test No 12 of BS 1377. The fill material prior to compaction shall be brought to a moisture content within the range plus or minus three per cent (± 3%) of the

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optimum as determined by Test No 12 of BS 1377. If watering is required it shall be carried out in such a manner as to ensure the even distribution of water throughout the layer to be compacted and the compaction operations will follow whilst the moisture content remains within the specified range.

- Frequency of Testing

The minimum testing frequencies shall be as follows:

The AASHTO T 99 MDD and OMC shall be determined at intervals of at least once per 50 cu.m of compacted material placed.

The field dry density shall be determined at least once per 50 cu.m of compacted material placed or at least three tests per 100m section, whichever is the more frequent.

Concrete Works

- Works Test

(1) Test cubes shall be made, cured, stored, transported and tested in compression in accordance with BS 1881, "Testing concrete". The method of compacting cubes by vibration shall be subject to the approval of the Engineer.

(2) A sample of concrete shall be taken at random each day of concrete of each grade made. The number of samples per day and the time which they shall be taken shall be varied at random or as directed by the Engineer.

From each sample three cubes shall be made for testing at twenty eight (28) days and two for testing at seven (7) days for control purposes. Concrete cubes will be tested for compression strength at a laboratory approved by the Engineer. An original test certificate will be submitted to the Engineer for approval of compression strength

- Consistency

The Contractor shall carry out slump, compaction factor or other workability tests as required during concreting of permanent works in order to relate the degree of workability of the mix with the numerical value obtained during the trial mixes.

Form 9-2-1

RECORD OF MEETING

Year month date

Supervisor _____

Contractor or IO _____

Project :_____

Subjects of meeting	Contents and results of meeting

Table 9-2-1

Dimension control chart

Chief supervisor	Supervisor	Chief engineer

Project:

Category of work:

Contractor:

Measured by:

Control Standard value A	Standard value B	Measuring unit

No.	Date	Measured point	Designed value C	Measured value D	Difference between Designed and E=D-C	Difference between Standard and F=A-E	Difference between Designed and Measured (– 0 +)

Sketch of measuring point

Items that should fill out

1.The colum of Work Category will be filled out with Category of work (item of control(Simbol)), such as Excavation (Standard elevation(V)), Flume(Thickness(T)), Base course(Eccentricity(e)), etc .

2. The colume of No. will be filled out with the order of execution, the colum of Measured point will be filled out with the number of measuring point

3. The colum of Date will be filled out with the date of measurment.

4. A proper unit, which is mm or cm or etc, of Difference between Designed and Measured should be decided by following the satandard values.

SAFETY CONTROL

1 INTRODUCTION

Health and safety is a key issue that must be considered by Contractors in any construction site.
Although it is a duty of the Contractor to ensure health and safety in the workplace, the Employer is also duty bound to ensure that construction work is inspected for compliancy. The Ministry of Labour and Youth Development has a policy on health and safety for workers known as "The Factories (occupational and health services) Rules, 1985. This policy provides a guide on health and safety issues in all working places including factories, buildings and civil works.

The Contractor shall provide emergency call networks (such as hospital, fire department, police stations) and display it in a table at his site office and main or branch office in case of accident, injuries and fire.

The employer shall inspect and check the Contractor's safety measures and systems during usual or special inspections at site. When he find any inadequate measures or systems, the Employer shall order the Contractor to improve or renew those.

2 THE HEALTH AND SAFETY POLICY

In the above Rules the term "Occupational Health Services" means services entrusted with essentially preventive functions and responsible for advising the Employer, workers and their representatives on:

a) The requirements for a safe and healthy working environment.
b) The adaptation of work to the capabilities of individual workers in the light of their state of physical and mental health.
c) The requirements for the establishment and maintenance of a workingenvironment that will facilitate optimum physical and mental health in relation to work.

The above Rules should be read together with "The Factories (Building Operations and Works of Engineering Construction) Rules, 1985. In these rules several matters are addressed related to health and safety. For example, under Part II - Duties and Application of the said rules are as explained below:

(a) Duties of Contractor to Ensure Health. Safety and Welfare:

. Every Contractor shall comply with the requirements of these Rules designed to ensure the health, safety and welfare of all persons engaged in building operations or works of engineering construction undertaken by him or in any activity, incidental to and at the site of the building operations or works of engineering construction.
. Wherever two or more Contractors with people employed occupy a site at the same time they shall co-operate to ensure safe working conditions.
. Except in such cases as may be prescribed, it shall be the duty of every Contractor to prepare and as often as may be appropriate revise a written statement of his general policy. The policy should be in respect to the health, safety, and welfare. Also, the Contractor should bring the statement and any revision of it to the notice of all of his employees.
. Every Contractor has a duty to carry out his work in such a way that persons not in his employment who may be affected by it are not exposed to risks to their health, safety and welfare.

(b) Notification of Commencement or Taking over of Operations of Work

A main Contractor shall, within seven days of commencing or undertaking building operations or works of engineering construction, notify the Chief Inspector, in writing of:
. the Contractor's name and postal address;
. the address or location of the site of the operation or works; . the date. of commencement;
. the expected date of completion;
. whether mechanical power is used or not;
. the number of persons expected to be employed

3 CONTRACTORS OBLIGATIONS TO HEALTH AND SAFETY

Standard Conditions of Contract incorporates contractual and administrative arrangements for health and safety throughout the execution of works.

The Contractor should have full regard for the safety of all persons entitled to be upon the site and keep the site and the works in an orderly state appropriate to the avoidance of danger to such persons.
The Contractor also, should provide and maintain at his own cost all lights, guards, fencing, warning signs and watching when and where necessary, or as otherwise required by the Employer or by any duly constituted authority, for the protection of the works or for the safety and convenience of the public. In order to create a safe working environment, the Contractor Should take a deliberate effort to educate and raise awareness of workers through laid down procedures. Accidents and injuries at site are caused by two major factors: Physical and human actions. These are explained as flows:

. **Physical actions**
Safety regarding physical related aspects includes elements such as use of plant, equipment and materials which are safe for workers, adequate and safe working spaces for workers and to ensure that utilities such as electric power supply in the site area should not cause safety hazard.

.**Human actions**
Employees at all levels should be given the necessary information and guidance to enable them to do their work safely. Information and guidance will facilitate practice of safe working methods. If safety is considered in construction operations some accidents resulting from human error can be avoided.
Some of the health, accidents and injuries prevention measures to be provided are as follows:

(a) General Site Conditions
(b) Falls of Persons
(c) Struck or Trapped by Failing or Moving Objects
(d) Injuries from Stepping on or Striking Against Objects
(e) Injuries from the handling of Objects and Materials
(f) Injuries from the Use of Hand Tools
(g) Risk of drawing
(h) Accidents from Machines in Transit on Roads and Tracks
(i) Accidents and Injuries due to Concreting Operations

Finally, the Contractor should immediately provide means of rescue in case of accident and injuries.
Reference; TACECA PRACTITIONERS HANDBOOK FOR GRAVEL ROADS CONSTRUCTION AND MAINTENANCE

Appendix 9-5 Handing Over Certificate

UNITED REPUBLIC OF TANZANIA
MINISTRY OF AGRICULTURE
NATIONAL IRRIGATION COMMISSION

HANDING OVER CERTIFICATE

National Irrigation Commission conducted construction of the following infrastructure in …… Irrigation Scheme

(i)…….
(ii)…….
(iii)…….
(iv)…….

This is to certify that we have constructed and completed the works as per requirements and handled over to IO on this date…./…./20…

This marks the start of O&M plan for sustainability of the scheme.

Signed……	Signed……
Name……	Name……
Position……	Position……
Date……	Date……
For: CLIENT	**For: IO CHAIRPERSON**

Signed……	Signed……
Name……	Name……
Position……	Position……
Date……	Date……
For: PROJECT MANAGER	**For: VILLAGE CHAIRPERSON**