

Terms of Reference
Technical Consultant
Providing services in the framework of a Study for
“Rehabilitation of Zemo Samgori Irrigation System”, Georgie
(ref. ORIO13/GE/01)

Introduction

The Ministry of Agriculture (MoA) in Tbilisi, Georgia has applied for a grant from the Dutch ORIO programme administered by NL Agency, Ministry of Foreign Affairs, concerning a project entitled “Rehabilitation of Zemo Samgori Irrigation System” (ref. ORIO13/GE/01). The project entails the rehabilitation of Georgia’s largest irrigation and drainage system with a total gravity irrigation network of more than 30,000 ha. The Zemo Samgori irrigation system is managed by the state company UASCG (United Amelioration Systems Company of Georgia).

The Minister for Development Cooperation and International Trade has awarded applicant MoA a grant for executing the first phase, the so-called Development Phase for the project. The Development Phase is a study phase which leads to a Project Plan describing the investment and exploitation (“Implementation and O&M”) phases. Upon completion of the Development Phase ORIO will assess the Project Plan for the subsequent Implementation and O&M Phases, and will decide on awarding a grant for these phases.

The overall objective of the Development Phase is to complete all preparatory works required for the actual implementation of the project. This will entail verification of the assumptions made during the project preparation, updating the relevant information and obtaining detailed surveys and analysis of the technical, social, environmental and institutional aspects. The results of the Development phase activities will be elaborated in the final and comprehensive Project Implementation Plan.

MoA is seeking a Technical Consultant, which, will act as main contractor under direct responsibility of UASCG to provide input for selected tasks required in the Development Phase.

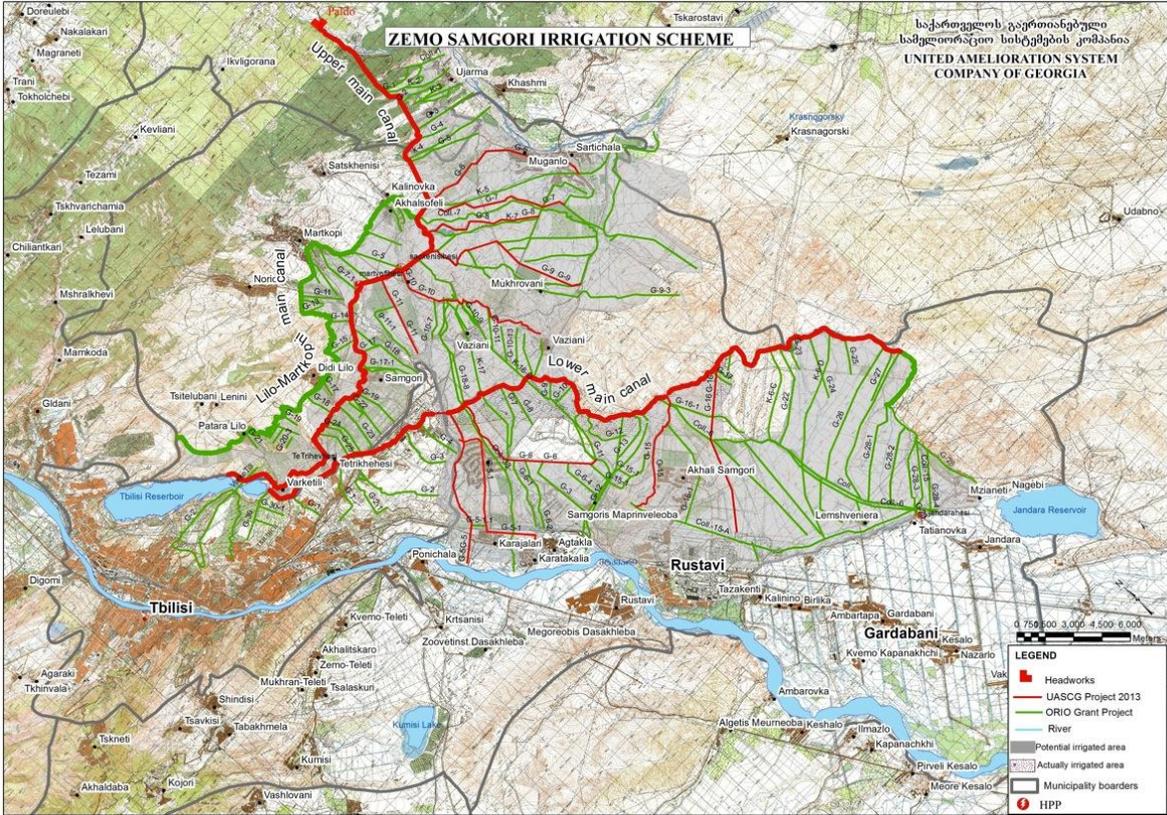
Background

Given the fact that 55% of the Georgian population is engaged in agricultural activities, contributing only 9% to the GDP of the country, it is evident that agricultural development is essential for the improvement of the household income and living standard in Georgian rural areas.

The Zemo Samgori irrigation system is designed to provide irrigation services to an area of 30,285 ha stretching out to the North-East direction of Tbilisi. It consists of a network of irrigation and drainage channels which comprises the following elements:

- Paldo headworks;
- Upper Main Channel with Lilo Martkopi Channel;
- Tbilisi reservoir;
- Lower Main Channel;
- Secondary Channels;
- Tertiary Channels;
- Drainage infrastructure.

The system receives water from the river Iori. Zemo Samgori has 82 km of main canals – 39.8 km in the Upper Main Channel and 42 km in the Lower Main Channel, and 236 km of secondary channels. It extends from the north of Tbilisi to the east of the country. Furthermore there is 35 km of drainage collectors, mainly in the Lower Main Channel area.



In the targeted project area of Zemo Samgori irrigation system there are estimated 27,532 agricultural households, of which 75% can be qualified as small farms and only 10% have more than 4.5 ha. The main crops cultivated are: wheat, maize, Lucerne, grass, potatoes, vegetables, grapes and fruit. Approximately 15% of the farms have access to the working Zemo Samgori irrigation system (19% in the Upper Zemo Channel area and about 12% in the Lower).

Irrigation services throughout the country, including that of Zemo Samgori, deteriorated heavily following the disintegration of the Soviet Union in the 1990ies. The main reasons for this included:

- *Lack of funds.* Irrigation budget decreased from USD 45 million in 1990 to USD 5 million in 1993, and stayed on that level up to 2005.
- *Weak institutional framework.* The management of the irrigation system was transferred between several different entities in the past 20 years, with a range of organisational and financing structures proposed and implemented as a consequence.
- *Weak users' organisation and confidence.* In parallel with the changes in the institutional framework, modalities of farmer co-operation (Amelioration Associations or AA's) were developed in 2004-2006. At present, however, AA's are not operational anymore while the fee recovery is slow and cumbersome. Farmers, however, have informal contacts with the irrigation authorities but the mutual relation has been damaged due to many years of unreliable irrigation supply.

¹ The total area covers 30,285 ha and the Georgian average of land per farmer is 1.1 ha. Source: Geostat, 2012.

- *Poor technical state of the irrigation and drainage system.* Physical deterioration of the greater part of the system has made it increasingly difficult to turn the trend around. Virtually no maintenance or regular repair has been done on the system for years, leading to complete falling out of almost 100% of the pumped irrigation and 80% of the gravity irrigation.
- *Limited ability of farmers to pay fees.* As water supply to farms has become unreliable, farmers have increasingly taken to livestock farming and cultivation of rain-fed crops. With 1.1 ha of land per farmer on average, this kind of activities barely earns sufficient income to meet the basic needs of farmers and their families. Payment of irrigation fees has therefore become too large a burden for small farmers, resulting in a very low level of income for the irrigation authorities, which in their turn were unable to invest in the improvement of the infrastructure.

Project

The overall objective of the project is to increase the participation of economically active agricultural farmers in enhanced commercialisation of the rural economy in Georgia. This will be achieved through the rehabilitation, operation and maintenance of the Zemo Samgori irrigation system.

The project will include the following:

- **Infrastructural works**

This component will include the civil works needed to rehabilitate the Zemo Samgori irrigation and drainage system. In 2007, a Feasibility study (“Feasibility Study for Rehabilitation of Zemo Samgori Irrigation System, Jacobs UK Ltd., 2007”) was conducted in preparation of the rehabilitation of the Zemo Samgori irrigation system. This study combined with other, recent studies carried out, resulted in the proposed rehabilitation of the following works:

Construction Works
- Upper Main Canal
<i>Main Canal</i>
Torcreting works, gates and valves
<i>Lilo-Martkhopi Main Canal</i>
Clearing and excavation
Demolition & Concrete Works
Pipes
Gates and Steelwork
Roadworks
<i>Secondary works</i>
Cleaning and Earthworks
Roadworks
Demolition and Preparation
Making Joints and Surface
Concrete Works
Steel Gates and Valves
Steel Pipework
New Structures
<i>Tertiary and In-field works</i>
Excavation works
<i>Drainage</i>
Excavation works
- Lower Main Canal
<i>Secondary works</i>
Cleaning & Earthworks
Roadworks
Demolition & Preparation
Joints & Surface Treatment
Concrete Works

Steelwork
Miscellaneous
New Structures
<i>Tertiary and In-field works</i>
Excavation, New structures
<i>Drainage</i>
Excavation works

- **UASCG Institutional and Capacity Building**

UASG staff at the headquarters in Tbilisi and in the field office at Varketili will be trained to enhance the public entity's capability to manage, operate and maintain the Zemo Samgori irrigation system in a sustainable manner. UASCG staff will be trained in subjects related to administrative and financial management, billing and fee collection, irrigation service provision, assets operation and maintenance, customer relation management, etc. This element is important as UASCG is currently re-vitalising the establishment of user associations. The project will provide training activities and advice to relevant UASCG staff to support the public entity in advising farmers on organisational aspects.

- **Extension and Awareness Raising Programme**

To restore the confidence of the farmers in the proposed rehabilitated irrigation infrastructure and related irrigation services to be provided, and to make the farmers aware of the income generating and market opportunities of producing certain (high value) crop varieties on irrigated land, the project will include an awareness raising programme. This plan will include extension services to existing and potential users of the infrastructure on (i) efficient on-farm water-use; (ii) opportunities for diversifying crop growing; (iii) associated agronomic practices. The extension services will be provided by extension officers made available by MoA. The services will include trainings and/or demonstrations. The programme will be targeting the existing and potential agriculture farmers of Zemo Samgori and will aim at increasing the use of the infrastructure as well at creating awareness of the economic potential of agricultural products.

- **Operation and Maintenance**

The O&M phase will include various components with a view to ensure sustained operations of the programme. The different components distinguished include:

- Refresher trainings for UASCG staff. At regular intervals during the O&M phase, key staff of UASCG will receive refresher courses which relate to the trainings received in the implementation phase. The trainings will ensure that staff remains prepared and updated to manage and operate the Zemo Samgori irrigation system in the long run.
- Continued Awareness programme. The UASCG will continue to build the confidence of the agriculture farmers in the irrigation levels, and try to promote the use of high yield crops by the end-users to fully grasp the rural economic potential. To that end, extension officers will receive updated trainings related to create further awareness amongst farmers on the economic potential in the agriculture sector, and to train the farmers in applying high-value crop practices.
- Preventive and/or corrective Maintenance. To ensure proper functioning of the infrastructure during the O&M phase, the project will foresee in preventive and/or corrective maintenance of the irrigation system.

Study Components of the Development Phase

The Development Phase consists of a number of tasks. Each task will result in a deliverable. The tasks and their objectives to which the Technical Consultant is expected to provide input, are described below:

Task 1: Site Investigation and Full Design of Works

The study will include geological, topographical, hydrological and technical aspects related to the condition of the different types of canals and hydraulic structures of the Zemo Samgori irrigation and drainage system. Using the data already available at UASCG as a starting point, the study will provide the updated analysis of the system and recommendations for the design of the rehabilitation works. The technical design for the rehabilitation of the Zemo Samgori irrigation network will comprise the detailed map of the irrigation system with identification of elements to be repaired/reconstructed including dimensions of each part, required materials etc. Finally, the preliminary Bill of Quantities will be developed for the whole Zemo Samgori rehabilitation project.

Task 2: Capacity Needs Assessment and Training and Awareness Raising Plan

This needs assessment at UASCG will be focussed on identifying and analysing the management structure, the organisation and the training needs of staff at the headquarters in Tbilisi and operational staff at the field office located at Varketili near Tbilisi reservoir. The main objective of the capacity needs assessment is to develop a capacity building programme answering to the needs of UASCG staff to effectively operate and maintain the irrigation infrastructure and provide high-quality services to end users. The needs assessment will take into account capacity building and/or awareness raising activities implemented by other donor organisations (e.g. WB, IFAD). Based on the findings of the needs assessment and activities of other donor programmes, the training and awareness raising plan will be developed for the staff of UASCG and the farmers of the Zemo Samgori area.

Task 3: Environmental and Social Impact Assessment

An Environmental and Social Impact Assessment (ESIA) study will be carried out to assess any possible adverse environmental and/or social impact of the proposed project and recommend mitigation measures, where required. The study will entail the risk assessment of land grabbing and other negative effects on the area and particularly on small farmers and the mitigation measures to counteract the risks.

Task 4: Financial Plan

The financial model will provide the updated financial calculation of the costs and revenues of the Zamo Samgori irrigation and drainage system, its cash flow projections and its financial sustainability in the long run based on different scenarios and pricing methods. The financial and economic analysis carried out will provide input to a tariff study, which will also assess the willingness of end-users to pay. Based on this study, a pricing policy will be developed and the financing plan for the project adjusted.

Scope of Work

The Technical Consultant will be responsible to deliver input in the following main fields:

- Site Investigation and Full Design of Works;
- Capacity Needs Assessment and Training and Awareness Raising Plan;
- Environmental and Social Impact Assessment;
- Financial Plan.

More specifically, the Technical Consultant is required to provide the following input related to the different tasks:

Task 1: Site Investigation & Full Design of Works

Activities:

(Site Investigation):

- 1.1 Review the 2007-Feasibility Study and other preliminary data available.
- 1.2 Undertake field trips and carry out additional field surveys to confirm desk study interpretation and gather supplementary data.
- 1.3 Undertake geological, hydrological and topographical analysis incl. ground and soil surveys.
- 1.4 Carry out technical assessment and prepare a map of the irrigation area with identification of elements (channels, tunnels, gates, nodes, etc).
- 1.5 Report on technical state of the irrigation and drainage infrastructure.

(Full Design of Works):

- 1.6 Define engineering solutions and proposed technology incl. specifications, dimensions, volumes, capacity etc.; assess the cost effectiveness of the proposed technology.
- 1.7 Study the health and safety requirements during rehabilitation works.
- 1.8 Prepare the Bill of Quantities (BoQ).
- 1.9 Prepare a work plan for the rehabilitation works.

Task 2: Capacity Needs Assessment & Training and Awareness Raising Plan

Activities:

- 2.1 Assess and describe the organisational and management structure of UASCG with a view of sustained management and exploitation of the proposed infrastructure.
- 2.2 Review the Human Resource (HR) policy of UASCG.
- 2.3 Assess available capacity and expertise within the company to manage and exploit the infrastructure in the long run.
- 2.4 Review training and awareness raising activities (and other activities which may be overlapping the project's activities) undertaken by other donors, including WB, IFAD.
- 2.5 Define a capacity building / training plan to enhance the skills and expertise of relevant UASCG staff.
- 2.6 Define an awareness raising plan including work plan targeting farmers in Zemo Samgori to enhance agricultural economies in the area.

Task 3: Social and Environmental Impact Assessment

Activities:

- 7.1 Design the social impact assessment study, including tools (survey forms) and schedule in accordance with the requirements of IFC Performance Standards-1.
- 7.2 Train survey assistants on the approach, methods and tools to be used in the assessment.
- 7.3 Implement the social assessment by carrying out consultations with stakeholders and supervise the implementation of the survey in the villages that will be impacted by the project.
- 7.4 Review the Environment Code of Practice and other Environment Impact studies and assessment documents.
- 7.5 Carry out the Environment Assessment of the proposed project.

7.6 Identify potential negative environment impact and its mitigation measures in the Implementation Phase and O&M Phase.

7.7 Report on the outcome of the ESIA.

Task 4: Financial Plan

Activities:

4.1 Analyse and gather financial and economic data with respect to costs of investments, operational expenses, finance costs, revenues generated.

4.2 Carry out a field and desktop study on the end-users' willingness to pay.

4.3 Gather benchmark data on tariffs and pricings of irrigation schemes in other selected countries.

4.4 Calculate the financial feasibility and commercial unviability of the proposed investment and operations.

4.5 Propose a tariff and pricing policy for the long term.

4.6 Assess financing options for bridging the gap between revenues and (at least the) Long Run Marginal Costs (LRMC) of the operation and maintenance of the infrastructure.

Furthermore, the Technical Consultant will take seat in a Steering Committee together with MoA, Ministry of Finance, UASCG and possibly other advisors/consultants. The Technical Consultant will organise meetings / interviews with relevant stakeholders whenever deemed necessary / appropriate.

Output

The study will result in the following set of deliverables, related to completion of the different tasks:

Task 1:

	Task	Deliverable
1	Site Investigation & Full Design of Works	Deliverable 1: Report on situational analysis, including survey and data collection, geological and geotechnical status of the Zemo Samgori System Deliverable 2: Report on full design of rehabilitation works, including engineering solutions, work plan, BoQ.
2	Capacity Needs Assessment & Training and Awareness Raising Plan	Deliverable 3: Report on UASCG Capacity Building / Training Plan Deliverable 4: Report on Awareness Raising Plan
3	Environmental and Social Impact Assessment	Deliverable.7: Report on Environmental and Social Impact Assessment, including mitigation measures
4	Financial Plan	Deliverable.5: Report on Financial Plan, including financial and economic analysis, tariff policy.

Budget

A detailed breakdown of costs associated with the underlying assignment will be established in cooperation with MoA, UASCG and the Technical Consultant. The final budget, to be drawn up excluding of VAT and local taxes, is subject to final approval by ORIO.