

Sindh Resilience Project (SRP)

**Terms of Reference
for
Performance Evaluation of Small Dams in the Sindh Province
for
Sindh Irrigation Department**

Introduction

Water is essential for life and for most activities of human society. Both economic and social development, and the maintenance of human health are completely dependent upon ready access to adequate water supplies. All societies require water both for basic survival and for economic development. The demand for water in all sectors is increasing day by day. The present main challenges to water resources are increasing population, economic and technological growth. The increasing population demands more foods, fruit and vegetables including animal products, whose feed also require more land and water resources, which are nearly constant.

Pakistan is the sixth most populous country in the world having total population of 179.160 million (UN data, 2012). and its population increasing day by day. About 60% of the population of the country is dependent on agriculture directly indirectly. Pakistan is a water stress country and has very little storage capacity. Water availability is a serious problem specially in arid and semi-arid regions of Pakistan. The major part of the population is settled in rural areas of Pakistan, which are fully dependent on the irrigated agriculture for their livelihood. Agriculture constitutes the major sector the country's economy and contributes about 22% of GDP. It can be observed that Pakistan is highly dependent on its agriculture for its economic growth.

In flood irrigation, farmers are at the mercy of extreme events of floods and droughts. To maintain the agricultural profession as a secured source of livelihood, an improved and sustainable system is required. The Government of Sindh has put great emphasis on the supply of irrigation and potable water to the population in urban, suburban and remote rural areas. The Irrigation Department, Government of Sindh has established Sindh Small Dams Organization (SDO), in Hyderabad, Sindh during 2006 to carry out studies and execute construction of small dams at feasible sites within the province. For this purpose, the SDO Sindh has already carried out studies in the regions of Kohistan. About more than 32 small recharge and storage dams have been successfully completed and yielding the benefits.

Objective

The overall objective of the study is look at the economic analysis/justification of small dams interventions, social impact, livelihoods, water quality and community and beneficiary impact.

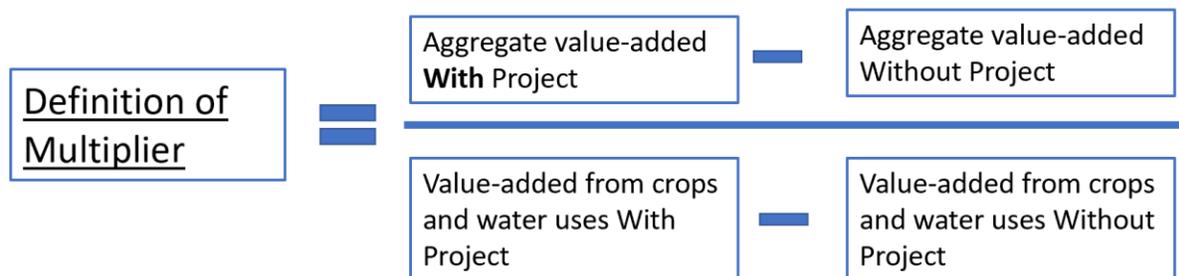
Direct and Indirect Economic Impacts

Direct impacts of a project are measured in terms of value of additional output of agricultural commodities, water supply, energy savings, etc. The changes brought about by direct impacts generally alters the nature and pace of the prevailing state of affairs in the project's and its surrounding region and through a "ripple" effect provide impetus to the economy resulting in increased overall economic activity in the region.

Indirect and induced economic impacts are those that stem from the linkages of the economic and other direct consequences of a project with the rest of the economy. Thus, the indirect economic impacts include: (i) inter-industry linkages, backward and forward, resulting in an

increase in the demand for outputs of other sectors, and (ii) consumption-induced impacts arising from additional incomes generated by the project.

The Economic Multiplier is a summary measure of the relative importance of direct vs. indirect economic effects expressed as a ratio of total to direct impacts.



It is appreciated that the ongoing Sindh Resilience Project (SRP) is “too young” to allow a meaningful quantification of its economic impacts, because their manifestation will take several years. However, the analysis should not focus solely on the numerical values of multipliers, but mainly at establishing an accounting system that looks at how the indirect effects are transmitted to the economy. That will permit to monitor the project during its implementation phase so that necessary corrective actions could be taken to enhance the growth linkages and in spreading the benefits to wider sections of the economy. Such actions take generally the form of policies aimed at strengthening institutions, information, access to credit, access to market, etc.

Scope of Work

The firm shall be responsible for undertaking following tasks:

Task I: Undertake Economic Impact Assessment

1. Define the economic region of analysis, e.g. an area lying within a radius of 5-10 kilometers of the village within which the village has strong economic ties in terms of the sale of commodities, purchase of inputs and consumption goods and for earning wage employment.
2. Identify the key sectors of the rural economy, e.g. agriculture, animal husbandry, biomass and fish, etc.
3. Assess the baseline economic situation before the start of the SRP, i.e. subsistence economy with minimal interactions amongst production units themselves or between the villages and the rest of Sindh.
4. Carry out the economic assessment of the “no-project” option (status quo) and comment implications.
5. Estimate the aggregate value-added under the “With Project” and the “Without Project” situations by the use of a Social Accounting Matrix (SAM) for the “economic region” defined to include the village and its neighboring areas.

6. The village-level SAM should be able to capture the interlinkages among village production activities, village institutions and the outside “world” (Taylor and Adelman, 1996).
7. The SAM should illustrate the flow of inputs, outputs and income levels between different production activities, the channeling of these incomes into consumptions and investments and the exchange of goods and factors between the village and the rest of the “world”.
8. Evaluate economic values-added and calculate “ex-ante” multipliers.
9. Determine distribution of income by category of household (e.g. marginal farmers, small farmers, medium farmers, large farmers, workers).
10. Recommend complementary resource management policies, and development of appropriate institutions for their management.
11. Recommend a plan for monitoring the economic outcomes of the investments.

Task 2: Estimate Groundwater Recharge

Number of methods are available for the estimation of natural and artificial recharge to the aquifer, selection of which depends on available data, local geographic and topographic conditions, spatial and temporal scale required, and reliability of results obtained by different methods. Main activities for this task includes:

1. Observations of monitoring wells and ground water table level for the estimation of water head difference.
2. Estimation of ground water extraction for various purposes.
3. The ground water modelling for selected areas.

Task 3: Impact of Recharge Dam on Groundwater Quality

Groundwater is vulnerable to contamination from a range of activities, such as industrial and agricultural enterprises and changes in land-use. Poor management of groundwater can cause many significant water quality problems, such as rendering water unfit for human or animal consumption. It is essential to ensure proper quality of water used for drinking and irrigation purposes. Main activities for this task include:

1. Water sampling at distinct places to perform different laboratory tests to check accessibility of water for drinking and irrigation purposes.
2. To examine the impact of dams on Groundwater Quality.

1. **Indicative Resources**Rural development specialist (core team)
2. Agricultural economist (core team)
3. Water resources specialist (core team)
4. Data collectors and analysts
5. Logistic and support staff

Deliverables

1. Inception report confirming methodology
2. Community consultations
3. Baseline economic assessment and economic impacts of the no-project option
4. Data collection and SAM population
5. Mid-term report
6. Multipliers analysis and distribution of income by household category
7. Final report and dissemination workshop

Expected Time Frame:

The assignment will be completed within six (6) months after signing the contract between Client and the Consulting Firm.

Coordination

The consulting firm will report to the Project Director, Sindh Resilience Project or any other staff designated. All work must be approved by the Project Director or the designated staff.

Qualifications

The interested firm must:

- Be a tax registered consultancy firm incorporated for at least five (5) years.
- The firm having experience of working with Sindh Government would be desirable.
- The firm and its staff must have experience of offering similar services and have completed similar projects of this scale and complexity.
- Consulting firm should propose a comprehensive approach, methodology, and work plan for the timely and effective completion of assignment.

Selection Process

Procurement will be completed following the Selection Based on Consultants Qualification (CQS) method in accordance with paragraph 3.7 of World Bank's Guidelines: Selection and Employment of Consultants [under IBRD Loans and IDA Credits & Grants] by World Bank Borrowers, January 2011 (revised July 2014).

Note: A list of existing small dams constructed by the Small Dams Organization and Sindh Resilience Project will be provided to short-listed consultants. The present TORs are largely based on and draw from the book "Indirect Economic Impacts of Dams (2008)".