

## Logical Framework Analysis (LFA): An Essential Tool for Designing Agricultural Project Evaluation

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**ABSTRACT:** Evaluation of a project at any stage of its life cycle, especially at its planning stage, is necessary for its successful execution and completion. The Logical Framework Analysis or the Logical Framework Approach (LFA) is an essential tool in designing such evaluation because it is a process that serves as a reference guide in carrying out the evaluation. The objective of this paper is to provide an overview of the process and the structure of the Logical Framework Matrix or Logframe, derivable from it, and its role in project evaluation. The paper is based mainly on review of relevant literature on this analytical tool. The literature search shows that the LFA enables the evaluator to thoroughly scrutinize and ensure that every key factor that is needed for the success of a project is clearly identified (as listed in the matrix cells – demonstrated in Figure 4) and thus must be provided for both in quantity and quality, and also at the appropriate time in implementing the project. It helps the evaluator to check for consistency of both vertical logic (project inputs ⇒ project outputs ⇒ project objectives or purpose ⇒ project goal) and horizontal logic (narrative summary ⇒ objectively verifiable indicators ⇒ means of verification) as well as the reasonableness of the underlying assumptions concerning the (proposed) project - all of which must be established for the success of the project to be ascertained.

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### INTRODUCTION

The underlying objective in any project, irrespective of its nature or sectoral bias, is to improve the welfare of the target beneficiaries. This could be in terms of increased income generating capacity, improved access to qualitative healthcare facilities, improved productivity, water and electricity supplies, *et cetera*; as the case may be. Whereas the requisite resources for the intended project may appear to be available and the ultimate goals of the project seemingly well defined, the processes and linkages that must be established to facilitate successful transformation of the resources to set goals are, often, either not well thought out, nor fully understood or taken for granted.

This is the bane of many development projects in developing countries of the world. In situations where volume of money voted and expended is erroneously used as an indicator of success of project, it is very easy to overlook the significance of incorporating and assessing each variable in the transformation linkages. For agricultural projects, in particular, given the interactive complementarities of most recommended modern input packages, failure to plan effectively for the sourcing/availability of each as at required time and in the right quantum/quality would imply that optimum yields cannot be attained or, at worst, result to partial or complete failure in output; irrespective of volume of money already expended. This is why project evaluation is so vital to ensure success. The

Logical Framework Analysis (LFA) is often used as a tool in the project evaluation process. It comprises “a set of interlocking concepts which must be used together in a dynamic fashion to permit the elaboration of a well-designed, objectively-described and evaluable project” (PCI, 1979). Its use thus ensures that the evaluator is able to check for the requisite consistencies in the logical linkages (both vertical and horizontal) for achieving the overall goal of any given project.

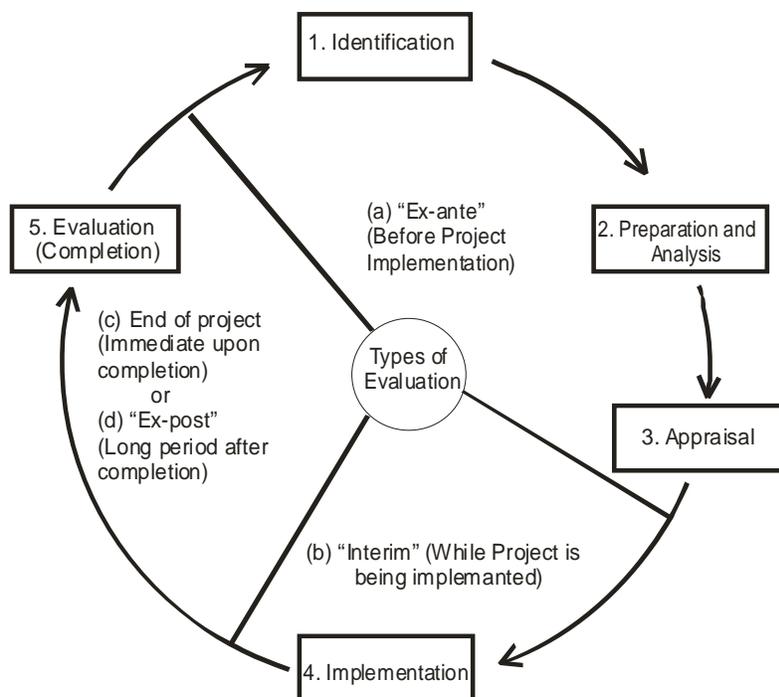
The paper focuses on the concept of the LFA, as a tool of analysis, with the aim of highlighting its usefulness and applicability in all facets of project evaluation designs/implementation.

**The project cycle and evaluation design:** The five (5) conventional stages in the project cycle are: (i) identification, (ii) preparation and analysis, (iii) appraisal, (iv) implementation and (v) evaluation (Gittinger, 1982). The World Bank, on the other hand, gives a slightly different terminology to the stages as:

(i) Identification, (ii) preparation, (iii) appraisal, (iv) implementation and (v) completion (Casley & Lury, 1982). Notwithstanding the fact that the term “evaluation” is added as the final stage of the project cycle in Gittinger’s (1982) classification, it can actually be undertaken at any stage of the cycle. For instance, during the 1<sup>st</sup> three stages of the cycle, as listed above (when actual implementation has not

commenced), an “ex-ante” evaluation can be conducted to determine the potential viability/success of the project prior to implementation. “Interim” evaluation, on the other hand, can be undertaken while the project is being implemented but has not reached completion/maturity. The “ex-ante” and “interim” evaluations are important as they provide opportunities for detection and correction of errors in project design before implementation is embarked upon or during implementation, respectively. This

makes for more effective implementation with greater prospects for success – both technical and cost-wise. Finally, “end-of-project” and “ex-post” evaluations are those done immediately upon completion of the project or the project has been operated for sometime before its completion, respectively, for purposes of assessing project impact and effectiveness. The inter-phase between the project cycle and the different types of evaluation is shown in Figure 1.



**Figure 1:** The Inter-phase between the Project Cycle and Types of Evaluation  
**Source(s):** Concept Derived from Various Sources in Literature.

**The LFA and its role in project evaluation design:** The objective of an evaluation design is to facilitate systematic application of evaluation criteria<sup>2</sup>, namely: the rationale for the project; the efficiency of resource utilization; and the effectiveness/impact of the project to the stated goal, purpose (objectives), outputs and inputs as well as the underlying assumptions of the project (Barau, 1984; Cummings *et al.*; 1984; CIDA, undated). It is the LFA, when properly conceptualized and represented in a form of Logframe Matrix that enables the evaluation design to be achieved and applied in evaluating any project of interest at whatever stage of its life cycle. According to Gawler (2005), an “LFA is an analytical process for structuring and systematizing the analysis of a project or

programme idea”. He also stressed that the process of LFA would allow a project to:

- “(i) involve stakeholders in the problem analysis and design of the project;
- (ii) systematically and logically set out the project or programme’s objectives and the means-end relationships between them;
- <sup>2</sup>These criteria are discussed in detail under APPENDIX at the end of the paper
- (iii) establish what assumptions outside the scope of the project may influence its success; and
- (iv) set indicators to check whether the objectives have been achieved.” He further stressed the importance of the LFA by arguing that it “provides a set of design tools that, when applied creatively, can be used for planning, designing,

implementing, monitoring, and evaluating projects. Logframes give a structured, logical approach to setting priorities, and determining the intended purpose and results of a project. Used correctly, logframes can provide a sound mechanism for project development.

Logical frameworks also lay the basis for activity scheduling, budgeting, monitoring, and for evaluating the impact, effectiveness, efficiency, and relevance of a project”

This derives from the fact that “LFA-based project assessment, when properly carried out, will:

- (i) foster reflection among the project implementers,
  - (ii) generate early warnings before things go wrong and allow for corrective decisions,
  - (iii) improve project monitoring and reporting, and
  - (iv) facilitate and improve project evaluation, both internal and external.”
- (Gawler,2005)

The LFA must not, however, be set in concrete or rigid terms nor attempt to provide every detail of a project. It should solely provide a summary of the key factors of a project that would guide planning, implementation or evaluation design towards ensuring success of the project (BOND, 2003).

The Logframe Matrix derived from the LFA is a two dimensional matrix having four rows and four columns which can be used to summarize the vertical logic and horizontal logic of a project (CIDA, op.cit). It is, thus, a 4x4 cells matrix (Figure 2); the morphology/contents of which are designed to provide details towards checking for logical sequences (of events and resources in the transformation process) that must exist to ensure attainment of stated project goal. It is pertinent at this point to elaborate further on these linkages.

(i) The vertical linkages (y-axis) can be described basically as addressing the “why” and “how” the project will be implemented; that is, what are the anticipated results and the means

mobilized to obtain them (BOND, 2003; CIDA, op.cit). Using the Narrative Summary (NS) column as an example, the vertical logic addresses the question of the requisite linkages for the overall success of the project, namely; given the overall project goal, what are the specific objectives that must be achieved to attain the said goal? Similarly, what products must the project yield to achieve stated objectives, and finally, what inputs must be acquired/employed to get the desired products?

(ii) The horizontal linkage (x-axis), on the other hand, outlines the conditions under which, and according to what terms, the elements of the vertical axis can be achieved and verified. In this instance, for each of the cells in the vertical logic, as enumerated under the Narrative Summary (NS), the LFA itemizes the pre-requisite parameters (indicators) which can be objectively verified (OVIs) as well as the means by which each can be verified (MOV). Finally, the horizontal logic lists the important assumptions (external factors which could influence the success of the project) underlying the project goal, purpose, products and inputs. This listing facilitates evaluation of the reasonableness of the assumptions against the backdrop of the required linkages and consistencies of the contents of the cells of the matrix. These can be assessed in the context of sources and availability of human and material resources, physical and institutional facilities, technical infrastructures, and other developmental indicators on which the success of the project is predicated.

In summary, the details of the cells of the LFA provide the evaluator with every relevant information to use in assessing the potentials for success or otherwise of a project. This it does by compelling the evaluator to “account” for the key factors required in each cell for the next cell, dependent on it, to be achievable as per the goal of the project. Similarly, verifiable and measurable indicators are provided to validate the stated parameters in the cells of the NS. This is illustrated in greater details in Figure 3.

LINKAGES

	NARRATIVE SUMMARY (NS)	OBJECTIVELY VERIFIABLE INDICATORS (OVI)	MEANS OF VERIFICATION (MOV)	IMPORTANT ASSUMPTIONS (IA)
PROJECT GOAL	C <sub>11</sub>	C <sub>12</sub>	C <sub>13</sub>	C <sub>14</sub>
PROJECT OBJECTIVES (PURPOSES)	C <sub>21</sub>	C <sub>22</sub>	C <sub>23</sub>	C <sub>24</sub>
PROJECT OUTPUTS	C <sub>31</sub>	C <sub>32</sub>	C <sub>33</sub>	C <sub>34</sub>
PROJECT INPUTS	C <sub>41</sub>	C <sub>42</sub>	C <sub>43</sub>	C <sub>44</sub>

Figure 2: Logical Framework Matrix

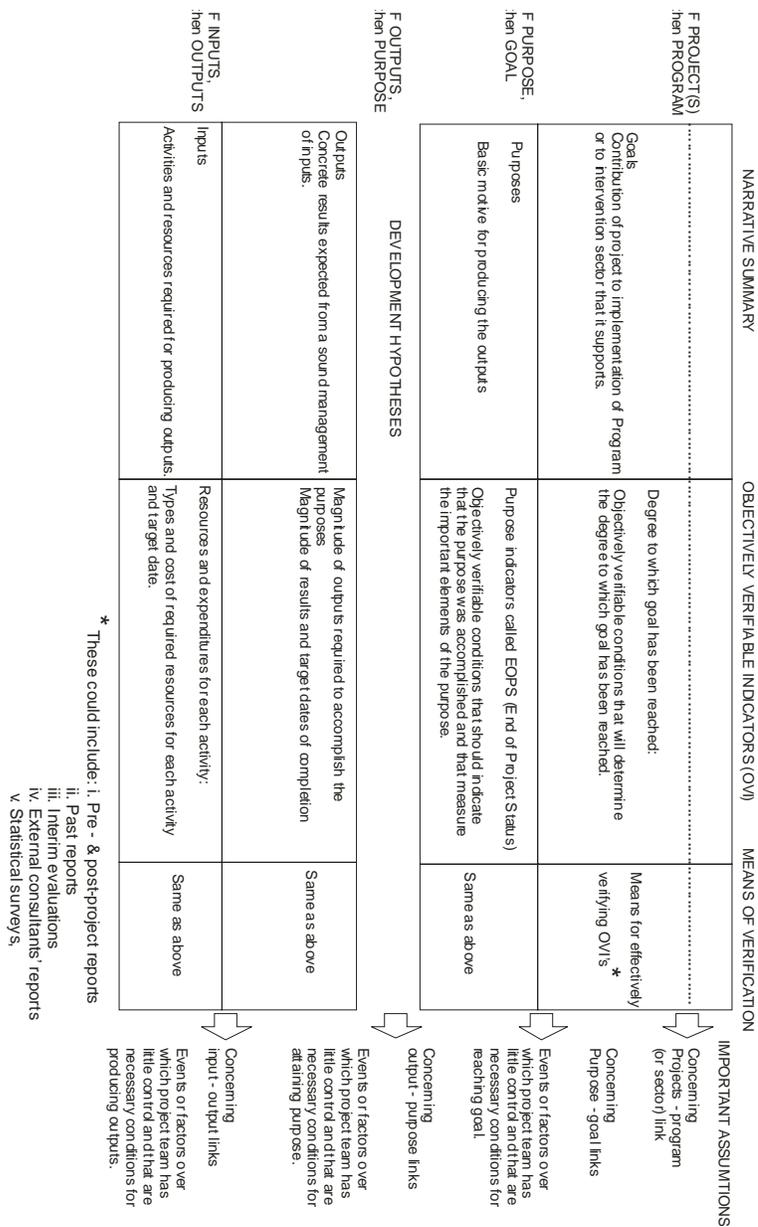


Figure 3: Logical Framework Matrix (Elaborated)  
Source: Adapted from CIDA (undated)

Figure 4, an extract from a paper by Barau (1984), provides a practical illustration of a Logframe of an LFA developed to be applied to undertake an **interim evaluation** of a (then) proposed CIDA-assisted irrigation project in Northern Ghana. The evaluation framework for the design was provided only by the programme draft proposal and the LFA/Logframe (Fig. 4) that was developed from it. Consequently, the design was handicapped in terms of providing exact details of timing, quantity and quality of inputs, outputs, services and so on. Where possible, dummies (for example, letters such as X%, year Y, and so on) were, thus, used to represent these variables in the Logframe developed.

For the said LFA Logframe (Fig.4), the NS lays out the vertical linkage by showing that:

- (i) to attain the project's goal of improving the standard of living of the people in the northern region of Ghana (the project area), a number of specific objectives (project purposes) must be achieved as indicated;
- (ii) the achievement of the said project objectives (such as improved food production, effective marketing and distribution systems for both inputs and farm produce, amongst others), on the other hand, is possible only if certain project outputs - such as establishment of farm inputs procurement/distribution systems, farm credit input, produce collecting centres, small irrigation facilities, among other outputs - can be obtained from executing the project; and
- (iii) finally, the specified project outputs, necessary for achievement of project objectives, are dependent on availability/utilization of the specified inputs.

Thus, by specifying these linkages in the Logframe of the LFA, the project evaluation design can then be developed and applied in assessing whether or not the key elements so identified are being achieved and thereby indicate whether the project is on track towards achieving its goal.

The horizontal logic of the LFA Logframe (Figure 4) is established by identifying the practical indicators of attainment of the parameters in the cells of the NS and how they can be verified. It states the expected roles of the Government of Ghana (GOG), CIDA and other donor agencies, the requisite technical manpower, infrastructures and institutions required, *et cetera*; for the project to succeed. Finally, it states the important assumptions underlying the entire project planning and execution.

## SUMMARY AND CONCLUSION

Figure 2 (which is elaborated in Figure 3 and practically illustrated in Figure 4) shows that the LFA guides the project evaluator to strictly scrutinize and ensure that the requirements of each cell, as pre-requisites for the attainment of the next cell (as well as achievement of the overall consistency in the vertical logic) have been fully met; being necessary conditions for the success of the project. Similarly, the conditions necessary for, and the terms under which the vertical logic can be achieved are outlined in the horizontal logic by specifying the achievement indicators (OVI) and the means of practically measuring them (MOV) as well as the underlying assumptions.

Thus, the development and application of the LFA by the evaluator will check whether or not key requisite inputs have been identified by the project management and plans for their availability/sourcing, as well as other logistics associated with their acquisition, was adequately made. Similarly, the timing of input availability and other supporting infrastructures and personnel (both local & international) are all addressed in the LFA. The nature and use of the products to achieve project objectives and, ultimately, goals are also addressed. In essence, therefore, the use of the LFA enables identification of any missing links, prior to or during implementation that could ultimately affect the success of the project, thereby enabling remedial steps to be taken to avert failure. The points raised above, therefore, clearly highlight the importance and potential of the LFA to contribute to the overall success of a project.

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	<b>NARRATIVE SUMMARY (NS)</b>	<b>OBJECTIVELY VERIFIABLE INDICATORS (OVI)</b>	<b>MEANS OF VERIFICATION (NOV)</b>	<b>IMPORTANT ASSUMPTIONS (IA)</b>
<b>P R O J E C T  G O A L</b>	To improve the standard of living of people in the Northern Region of Ghana. (This is the overall program goal to which this project contributes through improved agricultural productivity and generation of higher real farm income).	<ol style="list-style-type: none"> <li>1) Disposable income (as expressed in the consumption of some X <u>basic commodities</u>) exceeds pre-project level and equal to or in excess of the national growth rate.</li> <li>2) Increased rate of regional development expenditure to match the national average.</li> </ol>	Sources of Information and Methods Employed: <ol style="list-style-type: none"> <li>1) National and Regional Development plans and progress reports.</li> <li>2) Agency reports.</li> <li>3) External evaluation reports.</li> <li>4) Statistical surveys.</li> <li>5) Pre- and post – project census documents.</li> </ol>	<ol style="list-style-type: none"> <li>1) Ghanaian Government (GOG) places high priority on, and allocates sufficient funds for the project.</li> <li>2) A good pre-project data base exists.</li> <li>3) Baseline data collection carried out.</li> <li>4) Other complementary projects in the program successfully carried out to provide some of the inputs necessary for the agricultural project to succeed (e.g. training of extension agents).</li> <li>5) GOG appreciates the need for inter-sectoral co-ordination.</li> </ol>
<b>P R O J E C T  P U R P O S E (<b>OBJE CTIV ES</b>)</b>	<ol style="list-style-type: none"> <li>1) To increase and improve the reliability of agricultural output in the target rural areas.</li> <li>2) Achieve quantity and quality food supply all year round.</li> <li>3) Establish effective marketing and distributing system for agricultural inputs and outputs.</li> <li>4) Enhance production systems and practices in line with good conservation and resource improvement by supporting agricultural research institutes at Damongo, Pong Tamale and Nyankpala.</li> <li>5) A self-sustaining, transformed and efficiently integrated and productive local agricultural base.</li> </ol>	<u>Achievement Indicators</u> <ol style="list-style-type: none"> <li>1) Increased agricultural output through increases in productivity and acreage planted and harvested of food and cash crops.</li> <li>2) Increases in net household incomes.</li> <li>3) Significant decrease in loss of productive top soil through erosion.</li> <li>4) Adequate number of milling and other food processing plants established half-way through the project duration.</li> </ol>	<ol style="list-style-type: none"> <li>1) National and regional information and reporting system.</li> <li>2) Socio-economic studies.</li> <li>3) Interim evaluations.</li> <li>4) Design for pre-feasibility reports.</li> </ol>	<ol style="list-style-type: none"> <li>1) Design studies in target areas largely accepted by GOG and incorporated into budgetary system.</li> <li>2) Conducive and stable Ghanaian economic/political environment in which to plan and implement development projects.</li> <li>3) Technical staff can be recruited and /or trained on time and in sufficient numbers.</li> <li>4) People trained through the development project remain in the project areas.</li> <li>5) Improvement in the home environment to induce qualified Ghanaians staying abroad to return and manage the development projects.</li> <li>6) No major adverse changes in the agro-climatic conditions.</li> </ol>

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<p><b>P R O J E C T  O U T P U T S</b></p>	<p>Increased number of/improvements in:                      1) Farm inputs procurement and distributing units.                      2) Farm credit unions.                      3) Farm produce collecting centres to facilitate evacuation to bigger regional and international markets.                      4) Small irrigation facilities, especially around the Lake Volta area.                      5) Farmers cooperative organizations and commodity marketing boards.                      6) Extension services.                      7) Appropriate size crop and livestock processing and storage plants.                      8) Provide rural all-season tracks to link producing areas and the major roads and thus to urban market centres; (an aspect of the program infrastructure development that has special bearing on the success of the agricultural project).                      9) Processing and storage facilities for</p>	<p>1) Expanded acreage devoted to food and cash crops.                      2) Increase in average size of livestock per family.                      3) More farmers have access to, and use modern inputs.                      4) Farmers can dispose of their produce easily and profitably.                      5) Double cropping per year (rain-fed and irrigation during the dry season).                      6) K - Kilometres of rural all-season roads constructed by year <math>y_n</math>.                      7) X-percent increase in number of farm service centres.                      8) 30 – 35% increase in local markets with facilities to handle and store increased farm outputs half-way through the project duration.                      9) 60 – 80% of farmers adopt and practise advanced economic and agricultural practices.</p>	<p>1) Project team’s quarterly and annual reports.                      2) CIDA project officers’ on-going evaluations.                      3) Consultant’s studies.                      4) Project monitoring reports (operational reviews and audits).                      5) Past reports.                      6) Follow-up interviews with project participants.                      7) Project regular reimbursements requests.</p>	<p>1) Human, financial and physical resources are available as projected in the plan of operation.                      2) There is cooperation among, and commitment by all government agencies, institutions and other participants in the project.                      3) Investment opportunities exist.                      4) Priorities can be established and agreed to by cooperating projects and regional development planning teams.                      5) Incentives exist for farmers to invest in more agricultural production.                      6) There is support for “bottom-up” planning and people’s participation.</p>
<p><b>P R O J E C T  I N P U T S</b></p>	<p>Required includes:                      1) Personnel (management, sectoral, planning, financial control); both Ghanaian and expatriates,                      2) Finance (budget).                      3) Personnel and equipment to strengthen extension services (visits, radio programs and field demonstrations).                      4) Farm inputs – fertilizers, seeds credit, livestock breeds, appropriate implements and tools, spare-parts, fuel supply and other chemicals.                      5) Vehicles, access roads, land improvement machinery and construction equipment.</p>	<p>1) Team fielded early by year <math>y_1</math>.                      2) Preparation of detailed work plan early by year <math>y_1</math>.                      3) Revised work plan, incorporating additional information from field surveys ready early by year <math>y_2</math>.                      4) External funding agencies and GOG sign program approval memorandum (PAM) in mid – year <math>y_2</math>.                      5) Funding commitments by CIDA, Germany, GOG, local support groups and NGOs made and fulfilled late year <math>y_2</math>.                      6) Construction Materials and equipment procured by mid – year <math>y_3</math>                      7) ‘N’ number of agricultural experts (Agric . Economists, Extensionists, etc.) with M.Sc./Ph.D), Planners, etc.) both Ghanaian and expatriates available by late year <math>y_2</math>.</p>	<p>1) Project information and reporting system.                      2) CIDA records.                      3) Regional development documents.                      4) Quarterly reports from Project Team.                      5) External evaluation reports.</p>	<p>1) Canadian expertise is available in terms of quantity, quality and commitment.                      2) Local expertise and manpower is available, or could be readily trained, in quantity, quality and commitment.                      3) Canadian, Ghanaian and other donors provide funds as projected in the plan of operation.                      4) Availability of necessary materials and equipment both from local and outside sources.                      5) Local socio-economic/political conditions are favourable for provision of inputs.</p>

**Figure 4:** Logframe of the Logical Framework Analysis (LFA) for the Agricultural Project Component of the Proposed NORRIP Strategy, Ghana

**APPENDIX<sup>3</sup>**

**(a) Rationale**

This criterion focuses on the choice of inputs, outputs, validity of the assumptions, and the relevance of the overall sectoral development programme. Key questions that could be raised in this regard include, amongst others, the following: -

- i. Were the types of activities selected as constituents of the agricultural project the appropriate ones, given the set-up of the local agricultural production system?
- ii. Were the correct locations chosen for implementation?
- iii. Were the assumptions valid? Did the types of inputs identified appropriate in obtaining the desired outputs?
- iv. Did the agricultural project fit well within the general structure of the programme with respect to achieving stated overall goal? How much local/grassroots participation was involved in the design and implementation of the project?
- v. Were there alternative and more suitable projects that could have been chosen? Were these examined? etc.

**(b) Efficiency**

Under efficiency, we are concerned with the transformation of inputs into outputs. Accordingly, some of the key questions of interest here are: -

- i. Were the resources used in the most optimal way possible? Could the resources have been used more productively in alternative activities?
- ii. Were local resources fully exploited in the production process? Would that have been more cost-efficient?
- iii. Could the outputs have been realized using other methods? Were such possibilities ever assessed?

- iv. Does the project management have adequate trained personnel (e.g. extension agents, etc.) and other supporting facilities/institutions to ensure efficient use of available resources? etc.

**(c) Effectiveness/Impact**

For most projects meaningful measures of their effectiveness/impact on the target population are possible only at the very end of implementation and best after some period of time well beyond completion. This notwithstanding, some elements of the effectiveness of a project can be assessed at the interim stage. For example, one should be able to assess the effectiveness of some already achieved outputs in meeting stated project objectives (purposes). Any weakness in this vertical linkage (output to purpose) might indicate potential problem in the overall linkage from inputs through to project goal, implying inevitable failure of project to achieve its anticipated impact on the local target group.

Thus, the interim assessment of effectiveness will aid in early identification of the potential causes of failure and thereby indicate the need for re-evaluation of the LFA and the revision of the project operational plan (POP) if need be.

Questions in this section are based on a comparison of expected outputs with actual outputs and, in some cases, unexpected outputs, and their effects on achieving project objectives. For

<sup>3</sup> These were adapted from CIDA (undated) example, were the purposes of the project achieved? Were needs for alternative approaches/issues/solutions identified? Were any lessons learned that would be used to improve the subsequent operation or other phases of the project and/or for other future projects.