HANDBOOK

For Logical Framework Analysis

ECONOMIC PLANNING UNIT

PRIME MINISTER'S DEPARTMENT

FOREWORD

The Logical Framework Approach (LFA) will be used for formulating and preparing development programmes and projects. It is an analytical, presentational and management tool that can aid planners to logically formulate and prepare programmes and projects. This is particularly relevant and in line with the outcome-based development planning strategy adopted for the Tenth Malaysia Plan, 2011-2015. The new approach will provide more time for the ministries and agencies to undertake detailed planning of their programmes and projects to ensure that the intended project outcomes are achieved.

This handbook is prepared to provide further reference to "*Pekeliling Unit Perancang Ekonomi, Jabatan Perdana Menteri Bilangan 1 Tahun 2009:* ***Garis Panduan Perancangan dan Penyediaan Program dan Projek Pembangunan***". It provides a step by step method of doing analysis and tips for preparing a good project brief in the form of a Logical Framework Matrix (LFM). Nevertheless, experience in doing LFA analysis and preparing LFM is strongly recommended to apply LFA in preparing good project proposals that can achieve targeted outcomes at the ministry and national levels. This is important as the government now wants to ensure that the implementation of the development projects will achieve the intended outcomes in Key Result Areas that can be measured and evaluated using Key Performance Indicators.

I hope this handbook will provide planning officers in districts, departments and ministries who are responsible for identifying, formulating and preparing development programmes and projects required to achieve the targeted national outcomes.

(DATO' NORIYAH BINTI AHMAD)
Director General
Economic Planning Unit
Prime Minister's Department

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18 Jamadilakhir 1431H

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THE LOGICAL FRAMEWORK APPROACH

1.0 OVERVIEW

Preparing a Logical Framework Matrix (LFM) is now a requirement by EPU as part of its programme and project preparation procedures. This handbook on the Logical Framework Approach (LFA) is provided as a reference and aid for Ministry/Agency officers involved in programme and project preparation. The aim is to support informed (and more consistent) application of this useful analytical, presentational and management tool. The Logical Framework Approach is an '***aid to thinking***', not a substitute for creative analysis. Testing of innovative new ways in which to use the analytical framework provided by LFA is encouraged. While the focus of this Guide is on the 'project', the analytical principles can be applied equally well to the design of programs, and even sector or country program strategies.

1.1. What is the Logical Framework Approach?

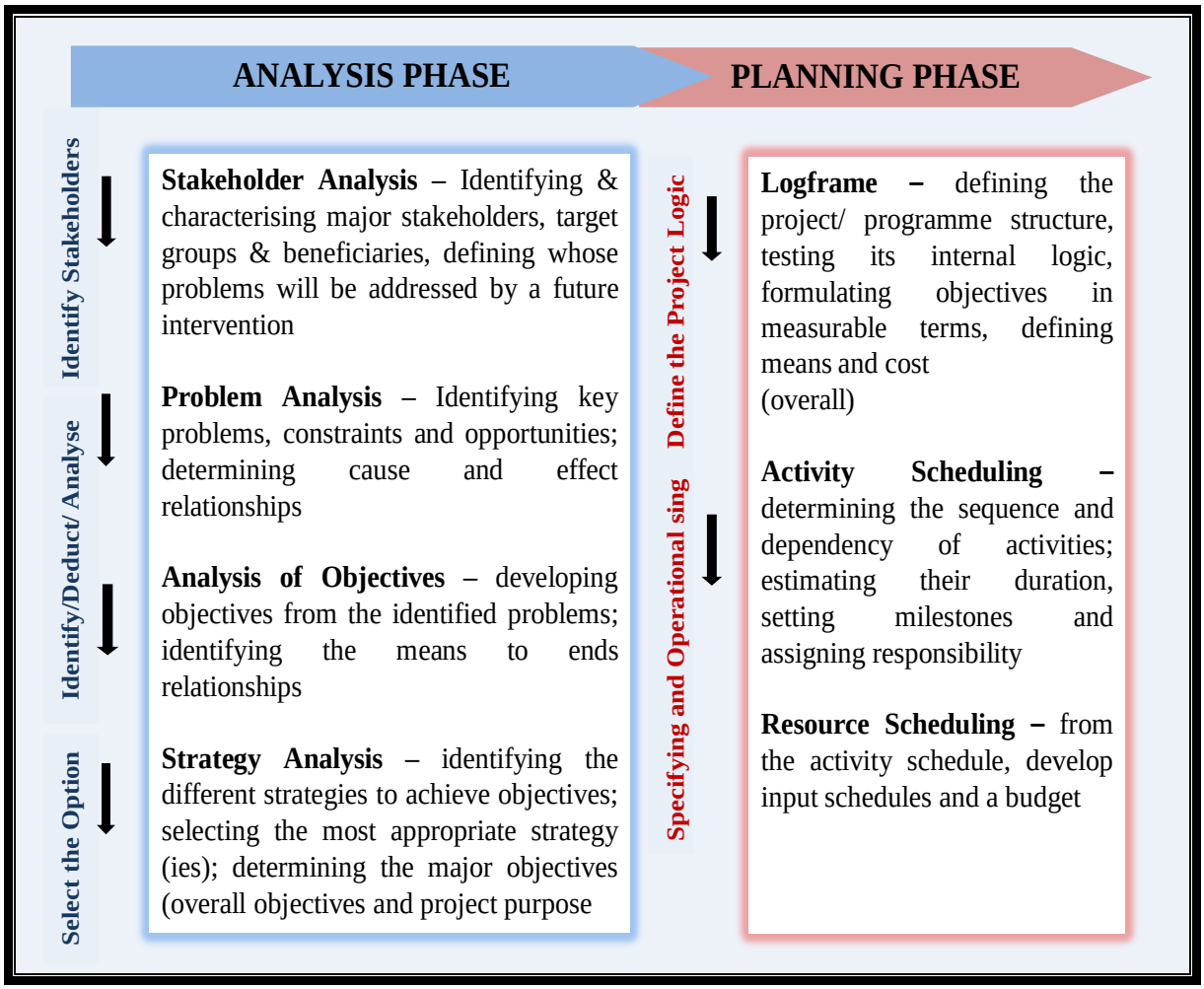
LFA is an analytical, presentational and management tool which can help planners to:

- analyse the existing situation during programme/project preparation;
- establish a logical hierarchy of means by which objectives will be reached;
- identify the potential risks to achieving the objectives, and to sustainable outcomes;
- establish how outputs and outcomes might best be monitored and evaluated;
- present a summary of the project in a standard format; and
- monitor and review projects during implementation.

A distinction is usefully made between what is known as the Logical Framework Approach (LFA) and the Logical Framework Matrix (LFM). The ***APPROACH*** involves problem analysis, stakeholder analysis, developing a hierarchy of objectives and selecting a preferred implementation strategy. The product of this analytical approach is the ***MATRIX*** (the Logical Framework), which summarises what the project intends to do and how, what the key assumptions are, and how outputs and outcomes will be monitored and evaluated**.**

The Logical Framework Approach consists of 2 phases – the Analysis Phase and the Planning Phase. The Analysis Phase consists of 4 steps – Stakeholder Analysis, Problem Analysis, Analysis of Objectives and Strategy Analysis whilst the Planning Phase consists of the Logical Framework Matrix and Activity and Resource Scheduling. The relationships between the two phases and the activities is summarised in the following **Figure 1.**

Figure 1: Logical Framework Approach



1.2. When should Logical Framework Approach be used?

Logical Framework Approach can be used throughout the management cycle in:

- identifying and assessing activities that fit within the scope of national and Ministry programs;
- preparing the project design in a systematic and logical way;
- appraising project designs;
- implementing approved projects; and
- monitoring, reviewing and evaluating project progress and performance.

1.3. Who should be involved?

Project planning and management should always be approached as a ***team task***. This requires that adequate opportunities be given to colleagues and key stakeholders to provide inputs to the process and product of LFA. This can be supported by:

- taking time to explain the principles of LFA and clarifying the terminology used;
- integrating effective team work and adult learning methods into meetings with stakeholder groups; and
- ensuring that stakeholder groups are involved in the initial situation and/or problem analysis.

ANALYSIS PHASE: ANALYSING THE SITUATION

- Stakeholder Analysis
  - Target Group
  - Other Stakeholders
- Problem Analysis
  - Preparatory Steps for Conducting Problem Analysis:
    - Step 1: Clarify the scope of the investigation or analysis
    - Step 2: Identify the relevant stakeholder group(s)
    - Step 3: Conduct the Problem Tree Analysis
- Analysis of Objectives
- Analysis of Alternative Strategies (Projects)

2.0 ANALYSIS PHASE: ANALYSING THE SITUATION

As mentioned earlier, the Logical Framework Approach (LFA) can be used to identify and formulate both programmes and projects and the methodology used is similar. However the Logical Framework Matrix (LFM) produced at the end of the analysis for programmes will stop at the ***output*** level and the outputs indicated will be the projects to be implemented under the programme to achieve the programme outcomes. In the case of the LFM produced during the identification and formulation of the projects will elaborate on the activities and the resultant implementation and resource requirement schedules. Prior to starting work on project design and the construction of a LFM, it is important to undertake a structured analysis of the existing situation. LFA incorporates four main analytical elements to help ***guide*** this process:

- stakeholder analysis;
- problem analysis;
- objectives analysis; and
- selection of a preferred implementation strategy

It is important to emphasise that effective development planning should be approached as an ***iterative process***, not as a linear set of prescribed steps. For example, while stakeholder analysis is presented here as coming before problem analysis, in practice, stakeholder analysis is on-going throughout the design process, and does not neatly fit in to any one step. The guidelines presented in this handbook should not be seen as a formula for project design but rather as a means of ***logically designing the project***.

2.1 Stakeholder Analysis[1]

The objective of the stakeholder analysis is to determine as to ***whom*** these problems actually impact most, and what are the roles and interests of different stakeholders might be in addressing the problems and reaching solutions.

The main purpose of stakeholder analysis is to identify all those who are directly or indirectly affected by the issue under discussion or whose actions may have consequences on any decisions made on the issue.

Stakeholder analysis is about asking the questions: "***Whose problem?***" and, if a project intervention strategy is proposed: "***Who will benefit*?**" The main steps in stakeholder analysis include:

- Identifying the principal stakeholders (these can be various levels, e.g. local, state, national);

[1] Stakeholder analysis is especially important for social sector projects such as health, education, rural development, etc.

- Investigating their roles, interests, relative power and capacity to participate;
- Identifying the extent of cooperation or conflict in the relationship between stakeholders; and
- Interpreting the findings of the analysis and defining how this should be incorporated into project design.

When looking at who the stakeholders are, it is useful to distinguish between the 'target group' and the broader group of stakeholders (the target group being one of the principal stakeholders).

A. Target Group

The target group is essentially those who are directly affected by the problems in question and who might be the beneficiaries of any proposed programme/project solution. Within any geographic area and within any 'community' there will always be considerable differences in people's access to resources and development opportunities. Some individuals and groups will benefit from the existing social, political or economic relationships and some will not. It is therefore important to gain some understanding about how different groups within the community are affected by specific development problems. Similarly, once a particular project intervention is chosen, there will usually be some groups who will benefit more than others. It is important to understand this so that the risks of pursuing the project strategy can be assessed in regard to the likely social and political support and opposition to the planned project. Strategies can then be devised to counter opposition, and/or strengthen support. The identification and appropriate involvement of the target group or beneficiaries in project design and implementation is also a critical factor in promoting the ultimate sustainability of the benefits.

B. Other Stakeholders

Stakeholders include both the target group and other government or private agencies (or groups) who have an interest in, or a responsibility for, addressing the identified development problems. Stakeholders might include individuals, communities, institutions, commercial groups, policy makers, NGOs, other government ministries/agencies at the Federal or State levels.

Examples of two matrix formats that can be used to help structure a stakeholder analysis are shown in **Tables 1 and 2**. The first can be used to provide a summary profile of how different stakeholders are affected by the main problem(s), and the second summarises how a proposed project intervention might affect different groups. The second matrix would therefore not be completed until after potential project objectives had been identified.

Table 1: Stakeholder Analysis Matrix – How affected by the problem(s)

Stakeholder	How affected by the problem(s)	Capacity/Motivation to participate in addressing the problem(s)	Relationship with other stakeholders (e.g. partnership or conflict)

Table 2: Stakeholder Analysis Matrix-Expected impacts of proposed intervention/solution

Stakeholder	Stakeholder's main objectives	Positive Impacts/Benefits	Negative impacts/costs	Net Impact

Both of these matrix formats can be adapted to include different or additional information about the main stakeholder groups depending on the scope and focus of the issues being addressed. It is important to see stakeholder analysis as part of the iterative process of project planning. As both problems and potential project objectives are analysed in more detail, the stakeholder analysis should be reviewed and updated to account for the new information that comes to light.

2.2 Problem Analysis

Preparatory Steps for conducting Problem Analysis:

There are number of steps that need to be undertaken when preparing the Problem Tree.

Step 1: Clarify the scope of the investigation or analyses.

Programme Identification and Formulation:

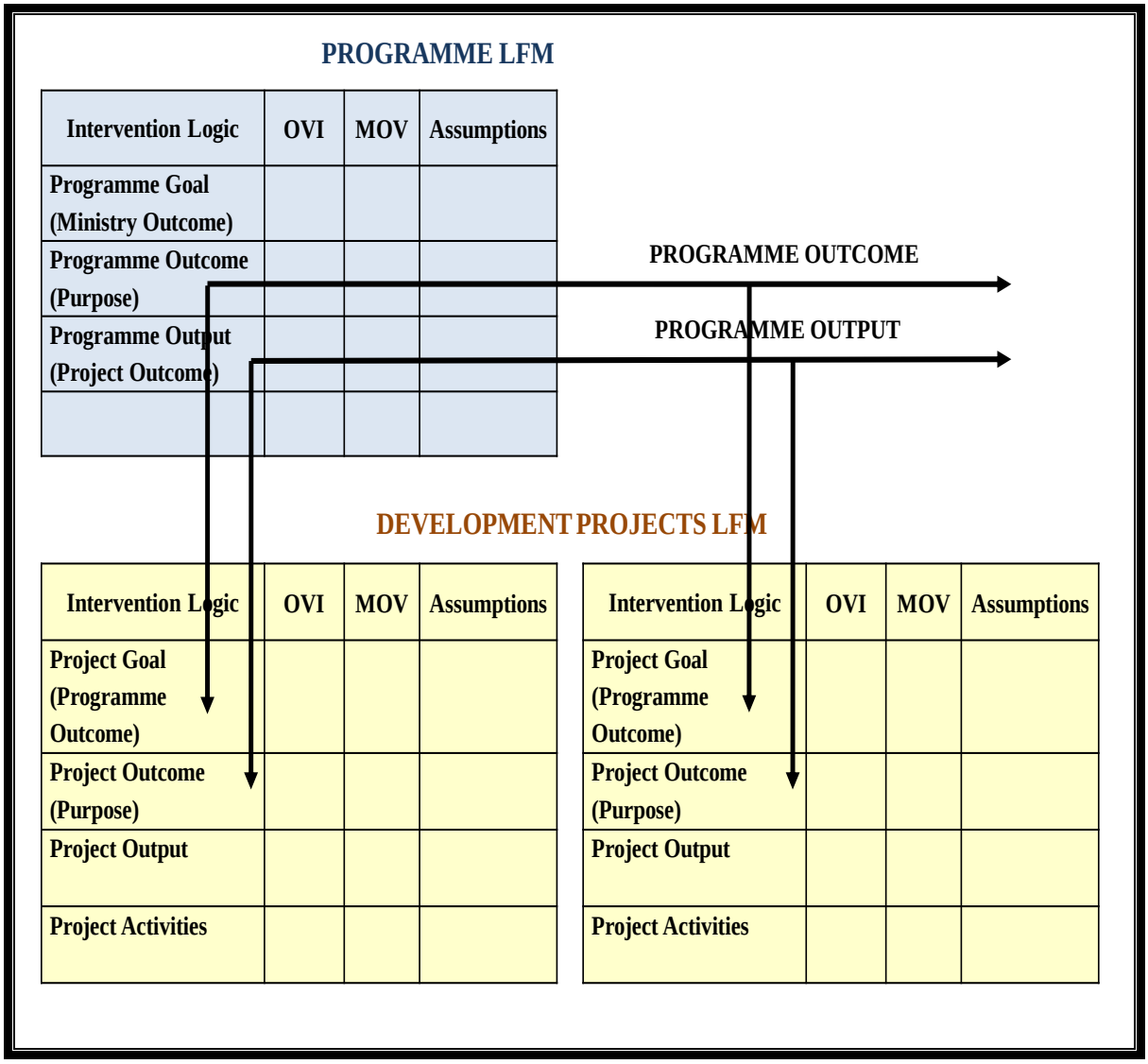
The Ministries have identified the Ministry's Key Result Areas (MKRAs) and the resultant Outcomes that the Ministry has to achieve during the Malaysia Plan period. The task for the planning group at the Ministry is to determine the problems/issues facing the

Ministry/Agency in fully achieving the stated outcomes/goals in the key result areas. This will provide the planning group with the scope of the investigation/analyses to be undertaken.

Project Identification and Formulation:

Once the Programmes have been identified and formulated in the form of a Logical Framework Matrix (LFM), the outputs will be the projects that will have to be identified and formulated to achieve the programme outcomes and finally the Ministry's outcomes in the Key Result Areas. As such, when undertaking the LFA analysis for projects, the scope of the analyses will be for the achievement of the related programmes' outcomes. The link between programmes and projects are as depicted in **Diagram 1** below.

Diagram 1: Link between Programmes and Projects



Step 2: Identify the relevant stakeholders group(s).

When identifying the problems that are hindering the achievement of an institution's goals, it will be useful to obtain the views of the stakeholders, i.e. all persons, groups, organizations and institutions that are connected with the project either directly or indirectly. The number and types of stakeholders will vary depending on the type of project that is being planned. In some instances, it might be possible to include them in the discussions when undertaking the problem tree analysis, but in other instances, the planning group could use some of the techniques available such as Rapid Appraisal Techniques to obtain some feed-back of the problems and possible causes. For example, if a health and sanitation problem is being discussed, then this may require a water supply as part of the solution, and so it is important to include a water supply engineer and an environmental health officer (among others) in the discussions. It would also be important to include community representatives who are willing or able to contribute in the exercise. A representative and technically competent group will be required to help effectively identify, analyse and organise ideas.

Step 3: Conduct the Problem Tree Analysis

Development projects are usually proposed as a response to addressing and overcoming identified development problems. Problem analysis involves identifying what the main problems are and establishing the ***cause and effect*** relationships between these problems. The key purpose of this analysis is to try and ensure that '***root causes***' are identified and subsequently addressed in the project design, not just the symptoms of the problem(s). A clear and comprehensive problem analysis provides a sound foundation on which to develop a set of relevant and focused project objectives. One main tool used in problem analysis is the ***'problem tree'***, and a description of the main steps to follow in conducting a problem tree analysis is provided below. Cards, marker pens, a white board or suitable wall space for display and some means of sticking and moving cards on the display area are essential to undertaking this exercise successfully.

Steps in conducting Problem Tree Analysis

1. **Identify and list the main problems**

- Explain the purpose of the exercise and the context within which it is taking place, e.g. preparation of a primary health care project. Explain the problem tree method and the inputs expected from the participants. Provide some examples of the cause and effect relationship before starting, emphasising the importance of identifying root causes;
- Using contributions from the group, list all the negative statements about the situation being analysed. This can be undertaken as a brainstorming session; and
- Print each problem statement in clear language on a card and display this on some suitable wall space.

2. Identify core problems

- Through discussions, identify a consensus core problem - the one(s) which appear to be linked to most negative statements.
- Print a precise definition of the core problem on a card (if the existing statement requires further clarification).
- Display the card on a wall (or on the floor) so that the whole group can clearly see it.

3. Identify cause and effect

- Begin to distribute the negative statement cards according to whether they are '***causes***', i.e. leading to the core problem, or '***effects***', i.e. resulting from the core problem. Do this until all causes are below the core problem and all effects are above the core problem. At any stage in the exercise, those statements that are considered to be unclear should either be more clearly specified or discarded. Problems that are clear but very general in nature and which affect not only this issue but would apply to almost any development problem can be treated as 'overall constraints' and moved to the side of the main problem tree. This helps keep the core problem tree focused and manageable. This can be guided by considering whether or not the problem is likely to be one which can be addressed by a project based solution. If not, it is a constraint.
- Then the guiding questioning for further structuring the statements into a problem tree becomes ***"What leads to that?"*** Choose any negative statement printed as a problem on the cards and ask: "What leads to that?" Then select from the cards the most likely cause of the problem, and place it below the chosen statement.
- If there are two or more causes combining to produce an effect, place them side by side below the resulting effect.
- After the card or cards have been placed for each relationship, pause to review. Then ask the group if there are more causes leading to that problem.
- Similarly it must be asked if there are any more effects resulting from that problem.
- If there are multiple effects resulting from a cause, place them side by side and above the cause(s).

4. Check the logic

- At each stage participants should be invited to move the cards, i.e. to suggest or hypothesize other relationships.
- When all the cards have been placed, review the structure to ensure that related streams of cause and effect are close to each other on the problem diagram.
- Choose one of the cards at the top line of the Problem Tree and work back through the diagram according to the guiding question: ***"What leads to, or causes, that?"*** in order to check the logic or completeness of the cause-effect structure.

5. Draft the Problem Tree diagram

- Then draw in vertical links to show cause-effect relationships, and horizontal links to show joint causes and combined effects; and

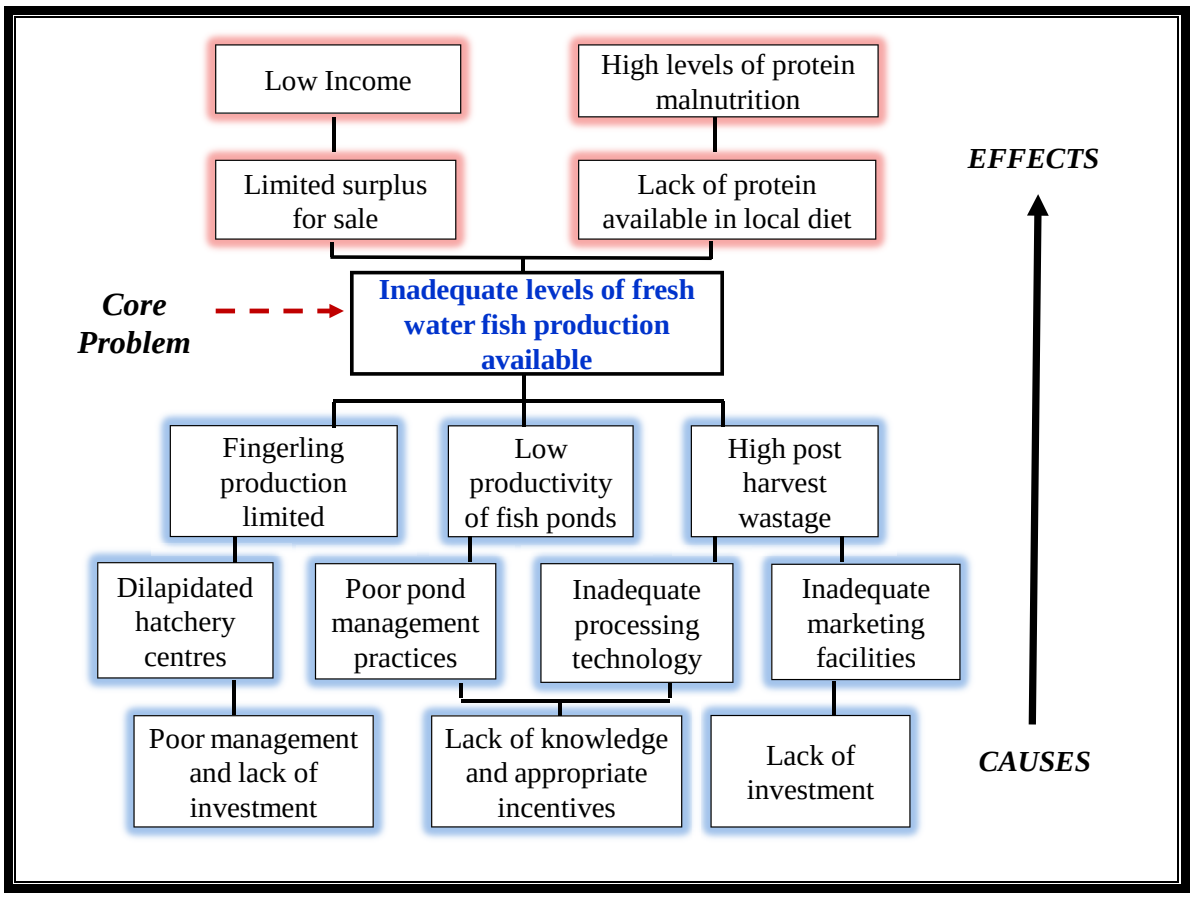
- Copy the diagram onto a sheet of paper and distribute it for further comments and variations within an appropriate time period.

Dealing with overall constraints

Overarching development problems that are identified during the analysis, but which cannot be addressed directly by a project based intervention, should be taken **out** of the main problem tree diagram and considered as overall constraints. Examples might include: institutional corruption, lack of government revenue, high population pressure. These overall constraints should then be considered as part of the risk and sustainability analyses undertaken later in the project preparation process.

A simplified example is shown in the **Figure 2** below for an aquaculture project.

Figure 2: Problem Tree Structure



There are two main approaches that one can use when using the problem tree tool to focus on the problem analysis.

- The first is the "***focal problem***" method where development problems or constraints are brainstormed and a core problem is identified by the group and then the cause-effect then pivots around the core problem that has been identified.
- The second is the "***objectives oriented***" method whereby a broad high level objective is specified at the start of the analysis and constraints to achieving this objective is then brainstormed, analysed and sorted into a cause-effect logic. This would be the case when identifying and formulating a project to meet the Ministry's programme outcome.

Both approaches are valid and which to use is determined by preference or/and circumstances.

2.3 Analysis of Objectives

Objective trees should be prepared after the problem tree has been completed and an initial stakeholder analysis has been undertaken. In its simplest form, the objective tree uses exactly the same structure as the problem tree, but with the problem statements (***negatives***) are turned into objective statements (***positives***). However, the results of the stakeholder analysis may have helped to give better focus to priority problems and not all of the original problem statements may therefore need to be translated into objective statements.

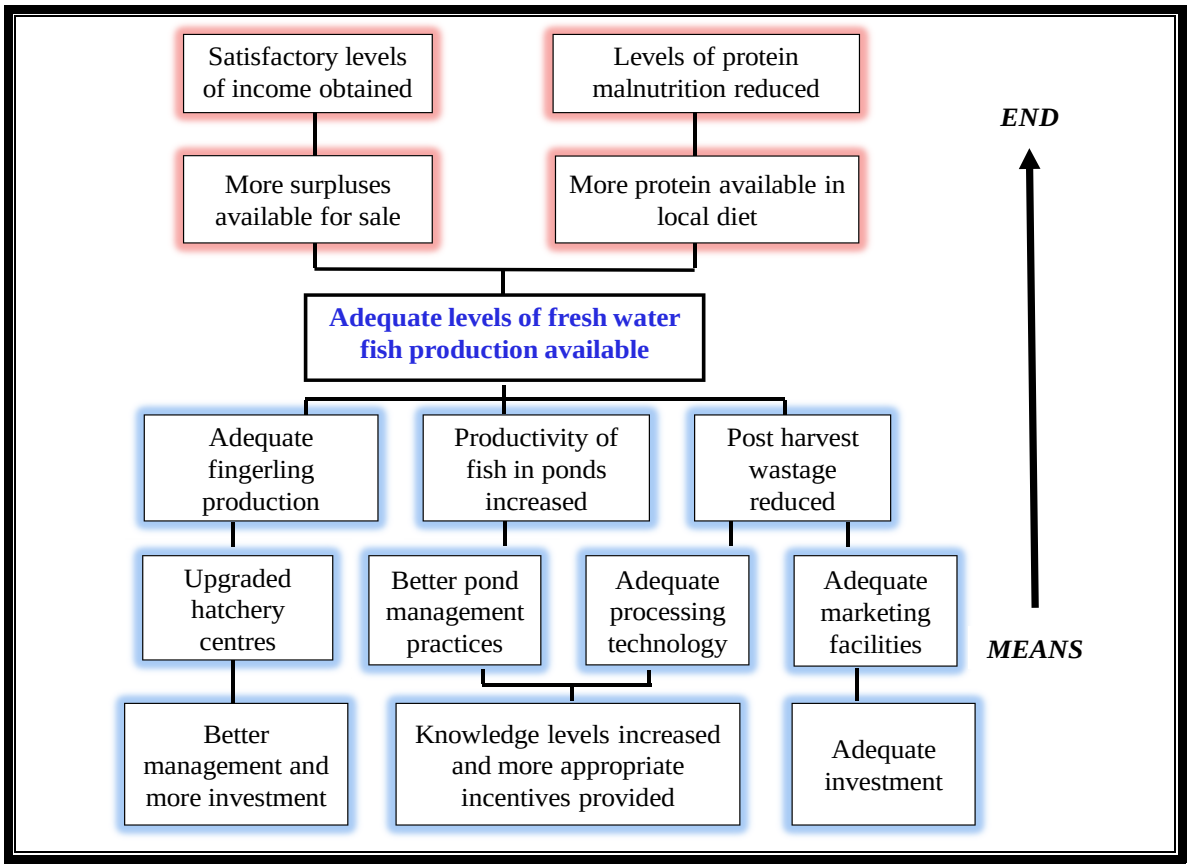
While the problem tree shows the ***cause and effect*** relationship between problems, the objective tree shows the ***means - end*** relationship between objectives. This leads directly into developing the project's narrative description in the Logical Framework Matrix. Once the negative statements from the problem tree have been re-worded to positive statements, the following should then be checked:

- Are the statements clear and unambiguous?
- Are the links between each statement logical and reasonable? (Will the achievement of one help support the attainment of another that is above it in the hierarchy?)
- Is there a need to add any other positive actions and/or statements? More details may be required.
- Do the risks to achieving the objectives and also having sustainable outcomes appear to be manageable?
- Are the positive actions at one level sufficient to lead to the result above?
- Is the overall structure simple and clear? Simplify if possible or necessary.

Once these main points have been checked, the proposed objective tree structure can be circulated for further comment and feedback.

The Objectives Tree for the simplified example of a Problem Tree for the aquaculture project given in Figure 2 is shown in **Figure 3** below.

Figure 3: Objectives Tree Structure



2.4 Analysis of Alternative Strategies (Projects)

During the process of analysing the problems, stakeholder issues and developing a draft objective tree, views on the potential merits or difficulties and risks associated with different possible project interventions are likely to have been developed and discussed by the planning team. These options then need to be further scrutinised to help firm up the likely scope of the project before more detailed design takes place. The type of questions that might need to be asked (and answered) could include:

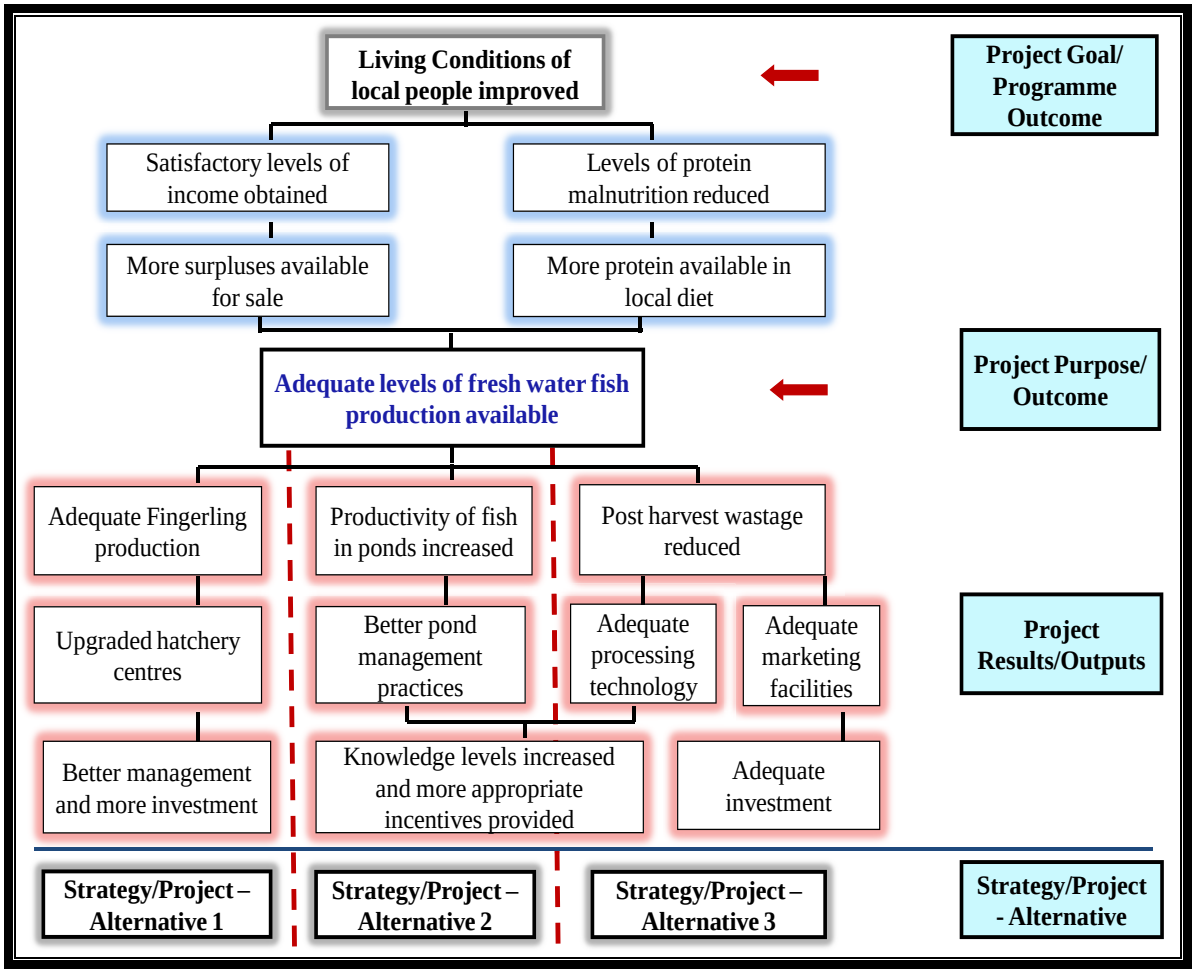
- Should all of the identified problems and/or objectives be tackled, or a selected few?
- What is the combination of interventions that are most likely to bring about the desired results and promote sustainability of benefits?
- What is the likely capital and recurrent cost implications of different possible interventions and what can be realistically afforded?
- Which strategy will best support participation by both women and men?
- Which strategy will most effectively support institutional strengthening objectives?
- How can negative environmental impacts be best mitigated?

To assess alternative interventions it is useful to identify and agree on a number of assessment criteria against which alternative interventions can be ranked or scored. Criteria that may be used to help make a broad assessment of different intervention options could include the expected:

- benefits to target groups - equity and participation;
- sustainability of the benefits;
- ability to repair and maintain assets post-project;
- total cost and recurrent cost implications;
- financial and economic viability;
- technical feasibility;
- contribution to institutional strengthening and management capacity building;
- environmental impact; and
- compatibility of project with sector or program priorities.

A possible analysis of alternative strategies for the example of the objectives tree used above is given in the **Figure 4** below.

Figure 4: Analysis of Strategies (Possible Projects)



From the analysis of strategies done above, it is seen that there are three projects or one project with 3 components that can be identified: -

1. Strategy 1. - Upgrade and better manage the Hatcheries
2. Strategy 2. - Improved Pond Management and training and incentives
3. Strategy 3. - Better processing and marketing and training and incentives

Once the strategies have been identified, the next step is to evaluate to see which of the strategies will be chosen to be implemented, given the constraints of resources or other factors. In this case, it could be implemented as 3 separate projects and the most crucial one selected for implementation. However, if all the 3 strategies are crucial for achieving the desired outcome, one project could be designed with the 3 strategies being designed as the project components. Once this is decided, the next step is the planning phase where the Logical Framework Matrix is constructed.

PLANNING PHASE: PREPARATION OF THE LOGICAL FRAMEWORK MATRIX (LFM)

- LFM
- Link to the LFM
- The LFM Format

- Definition of Terms used in a LFM
- Preparation of a LFM
- Some Practical Hints in Developing the LFM
- Management Influence

- Project Components
- Reference Numbers and Flow Charts
- Writing Clear Objective Statements
- Assumptions and Risks
- Horizontal Logic

- Testing the Project Description
- The Level of Detail
- Indicators
- Means of Verification
- Implementation, Resources and Cost Schedules

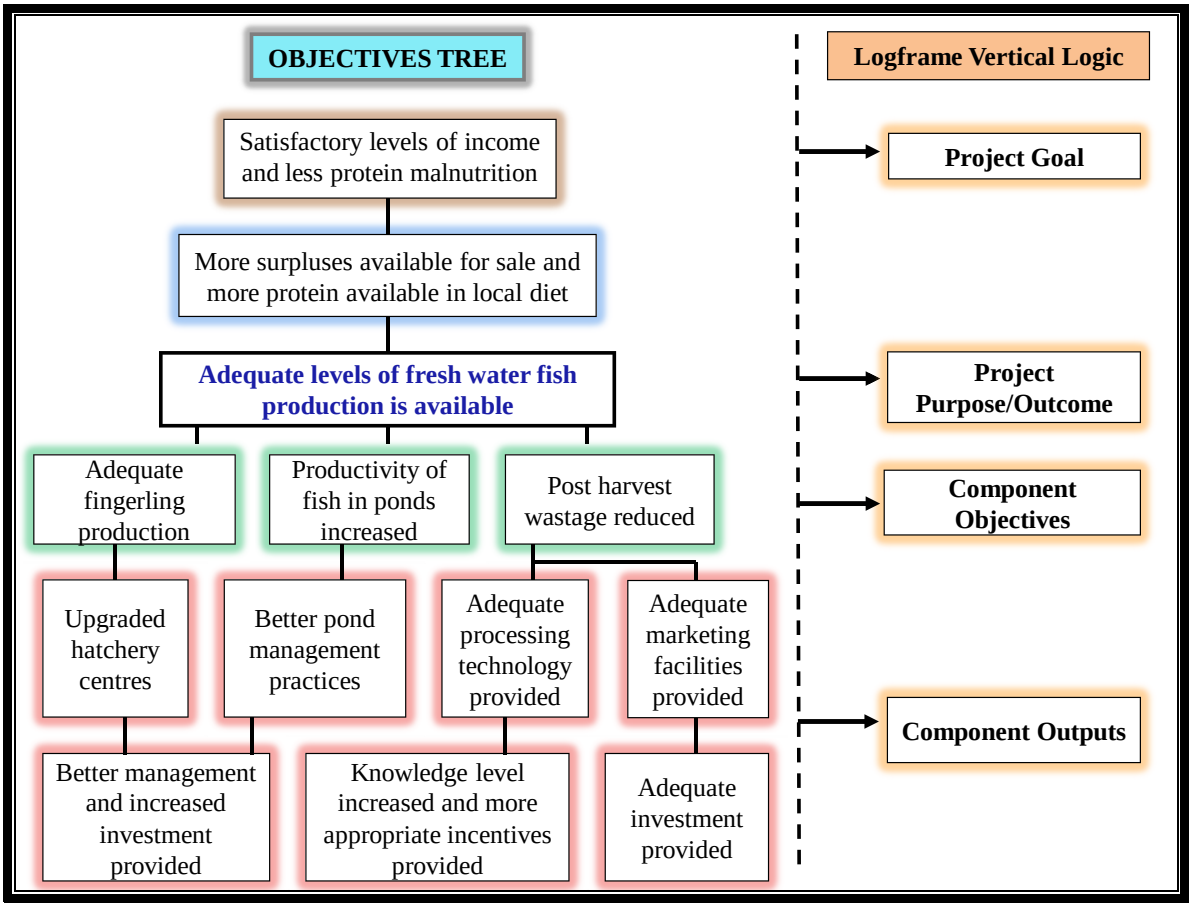
3.0 PLANNING PHASE: PREPARATION OF THE LOGICAL FRAMEWORK MATRIX

3.1 The Logical Framework Matrix

3.1.1 Link to the Logical Framework Matrix

Figure 5 below shows how the objective tree can be used to start framing the objectives hierarchy in the first column of the Logical Framework Matrix. Objectives at the top of the tree should help frame goal and purpose statements, while further down the tree project and component objectives and output statements can be identified. However, it should not be expected that the objective tree can be transposed ***directly***, without further adjustments, into the hierarchy of the project description in the matrix. Further adjustments and refinements of statements are usually required and checking of the means-ends logic should be on-going as the matrix is being developed.

Figure 5: Objectives Tree and link to Logical Framework



Note: The component outputs together will be the project's output.

3.1.2 The Logical Framework Matrix Format

The results of the logical framework analysis are presented and further analysed through the development of a Logical Framework Matrix. The matrix should provide a ***summary*** of the project design and, when detailed down to output level, should generally be no more than five pages long. Activities may be listed in the Logical Framework Matrix itself, however it may often be better to describe 'indicative' sets of activities (required to deliver each output) in the main narrative of the Project Brief.

The implementation and resource schedules can also be used to further detail when key activities are expected to take place and this could be given in the appendix. The Logical Framework Matrix has four columns and usually four or five rows, depending on the number of levels of objectives used to explain the means-ends relationship of the project. Sometimes a project may consist of different components whose implementation will contribute to implementing the project and therefore achieve the project's objectives. In this case, there will be additional rows indicating the component objectives. In this case, the activities and outputs will be connected through appropriate numbering[2].

The option of whether or not to include both an overall project purpose and component objectives should be left open to the project planning team, depending on the scope and complexity of the project. For example, in some cases it may be sufficient to have a goal and purpose, and to leave out the component objectives.

The ***vertical logic*** identifies what the project intends to do, clarifies the causal relationships, and specifies the important assumptions and uncertainties beyond the project manager's control (columns 1 and 4). The ***horizontal logic*** defines how project objectives specified in the project description will be measured, and the means by which the measurement will be verified (columns 2 and 3). This provides the framework for project monitoring and evaluation.

Figure 6 below shows the structure of the matrix and indicates the general sequence for completing its component parts. The project description is completed first, then the assumptions, indicators and finally the means of verification. However, completing the matrix must be approached as an iterative learning process. As one part of the matrix is completed, there is a need to look back at what has been said in previous parts to review and test whether or not the logic still holds. This process will often require the modification of the previous descriptions.

[2] The details are given later in Para 3.7 under Reference Numbers and Flow Charts

Figure 6: Logical Framework Matrix Structure and Sequence for Completion

Project Description (*Intervention Logic*)	**OVI** *(Objectively Verifiable Indicators)*	**MOV** *(Method of Verification)*	**Assumptions**
1. Goal:	10. Indicators	11. MOVs	
2. Purpose/Objective:	12. Indicators	13. MOVs	9. Assumptions
3. Component Objectives:	14. Indicators	15. MOVs	8. Assumptions
4. Outputs:	16. Indicators	17. MOVs	7. Assumptions
5. Activities:	*Milestones specified in activity schedules and scope of services. Work plans and management reports on physical and financial progress*		6.Pre-Conditions

It is also recommended that in most cases the matrix itself should ***not*** include a complete listing of the activities required to produce project outputs but only state the main activities. The main reason for this is to keep the matrix as a concise summary of ***what*** the project aims to deliver, rather than specifying in too much detail ***how*** it will be delivered. Activities required to deliver outputs should instead be separately detailed in an implementation schedule format, using reference numbers to link each group of activities to a specific output, and/or as a narrative description in the main body of the Project Brief Document's text.

3.2 Definition of Terms used in a Logical Framework Matrix

The Logical Framework Matrix uses a set of terminology and therefore it is important to define the commonly used terms.

Project Description	The narrative description of the project at each of the four or five levels of the project hierarchy used in the LFM.
Goal (Ultimate Objectives)	The ultimate objective for which the project is undertaken. Its realisation depends critically on the interaction of various external conditions with the project's purpose(s), upon which the project authorities have little or no control and equates with final impacts, which may be manifested outside the project investment period (e.g. improved incomes, decreased child mortality, environmental degradation stopped, better nutritional status, etc.).
Purpose (Immediate Objectives)	What is expected of a project in development terms as a result of the outputs that are produced. Whilst the purpose is the motivation behind a project's outputs, it falls outside direct project behind a project's outputs, it falls outside the management's control, and often equates with the end of project status (e.g. improved crop yields/productivity, increase of total production, area rehabilitated, etc.).
Outputs (Results)	The specific results and tangible products/services produced by undertaking a series of tasks/activities using the project inputs (e.g. an irrigation scheme, expanded Maternity and Child Health Clinic coverage, better trained staff, etc.).
Activities	Tasks and operations carried out by project personnel to transform project inputs into outputs (e.g. designing small-scale irrigation systems, training, construction, marketing, etc.)
Inputs/Resources	The resources required to perform the project activities (e.g. personnel, funds, equipment, materials, etc.). Many Logical Framework users combine Activities with Inputs. The advantage of separating them lies in using the list of activities to prepare an implementation time-table and a related budget.

Objectively Verifiable Indicators (OVI)	Measurable indicators that will show whether or not the expected results have been achieved at each level of the Logical Framework hierarchy (e.g. better quality of life (goal), higher incomes (purpose), higher crop production (output), staff and facilities in place (inputs). Each indicator must be objectively verifiable in that different independent observers would come to the same conclusion as to the status of the achievement. Verifiable indicators may not always be quantifiable, and can be qualitative measures. They also provide the basis for designing an appropriate management information system.
Means of Verification (MOV)	The means, methods and sources by which the key indicators (OVI) will be recorded and made available to project management or those evaluating project performances (e.g. project reports, farm surveys, market and production statistics, financial records, etc.). They help to confirm that the indicators chosen are realistic and measurable.
Assumptions	Conditions which could affect the progress or success of the project, but over which the project management has no direct control (e.g. price changes, weather conditions, land reform policies, etc.). Conditions (if any) attached to the provision of aid are also included.

3.3 Preparation of a Logical Framework Matrix

The preparation of the project Logical Framework Matrix facilitates the specification of:

a) Project objectives along with the criteria by which these could be gauged; and
b) The assumptions, upon which causal linkages between various levels of objectives are premised.

As such, the LFM is especially suited as an aid to both project design (formulation) and monitoring and evaluation activities. In the simplest form, the LFM consists of a 4x4 matrix in which the **rows** represent the different hierarchical levels of objectives (inputs, activities, outputs, purposes and goals) in an ascending order. The construction of the Narrative Summary of the LFM involves a detailed breakdown of the chain of causality implicit in project design. This can be expressed in:

IF

Inputs are provided,

THEN

Activities can be undertaken;

IF

Activities are undertaken,

THEN

Outputs will be produced;

IF

Outputs are produced,

THEN

Objectives will be achieved;

IF

Objectives are met,

THEN

The project will have contributed towards achieving the wider goal.

It can be seen that from the above that the vertical logic is a set of means and ends inter-related by the **IF-THEN** condition. An important element of the vertical logic is the set of assumptions, risks and conditions upon which the movement from the lower to the higher level objectives is based. For instance, even if inputs are made available, factors outside the management's control could have an influence on whether outputs would be attained. Similarly, project outputs may not lead to the purpose being achieved if certain assumptions (e.g. about people's behaviour such as farmers' response or market conditions) are not valid. The test of a good project design thus rests in making the best possible judgment in the assumptions-risk-conditions set.

The **horizontal logic** of the LFM permits a statement as to the criteria and means by which the project achievement and success could be gauged. This is done through the inclusion of the **OVI** (Objectively Verifiable Indicators) and the **MOV** (Means of Verification) columns. As far as possible, the OVI should be quantifiable in clear units of measurements (e.g. no. of hectares, tons of produce, KM, etc.) while the latter should refer to either primary or secondary sources that could provide data of acceptable quality.

3.4 Some Practical Hints in Developing the Logical Framework Matrix

In drawing up a LFM, the following points are noteworthy:

- Start by specifying only the first and last columns (objectives and assumptions) leaving the other columns and rows blank, using a 4 x 4 matrix.
- Add the OVI and MOV columns later, only after the project logic has already been clearly established.
  Be careful not to confuse a LFM's outputs with production e.g. agriculture production. The former can be any project achievement such as km. of roads built, number of people trained, or hectares of land cleared/planted by the direct use of project inputs. The production is often a **purpose** (immediate objective) which may result, e.g. from the effects of having trained a certain number (i.e. **output**) of farmers in an improved farm technology.
- The assumptions in the last column should always link one level of objective to a specific objective from the **previous** level. The assumptions **should not** be inserted at random.
- For project design work, a number of iterations of the LFM are often necessary before arriving at the final version. Examining and re-examining the assumptions, risks and conditions, and reviewing whether the project scope is adequate for the attainment of successive levels of objectives would be required.
- **Team Effort**, preferably of an inter-disciplinary nature and a certain amount of **'brain storming'** is highly recommended.
- It is best to start constructing a LFM early in the project formulation stage - before writing the main text which describes the project. The LFM can then provide the structure of the narrative of the main report. **Do Not** write up the project report and

then try and squeeze it into a LFM for the sake of complying with project design requirements.

3.5 Management Influence

The LFM helps to indicate the degree of control managers have over the project. Managers should have considerable direct ***control*** over inputs, activities and outputs, but can only be expected to exert ***influence*** over the achievement of project purposes through the way in which outputs are managed. Project managers usually have no direct influence over achieving the goal, and can only be expected to monitor the broader policy and program environment to help ensure the project continues to be contextually relevant and the benefits likely to remain sustainable.

The ***necessary*** and ***sufficient*** conditions within the vertical logic are another way of viewing this issue. These indicate that:

- Achieving the purpose is ***necessary but not sufficient*** to attain the goal. This is because the project is but one of a number of projects or initiatives that contribute to the goal;
- Producing the project outputs is ***necessary but may not be sufficient*** to achieve the component objectives. Other factors beyond the project's control are again likely to have an influence on achievement of component objectives; and
- Carrying out project activities should be ***necessary and sufficient*** to produce the required outputs (although some risks will always remain).

In defining project outputs it is also necessary to recognise that there may be no single agency or manager who has complete control over their delivery. In the case of a number of physical projects such as schools and hospitals, where the project manager could be from the Ministry (e.g. Ministry of Health, Ministry of Education), the implementing agency may be the Public Works Department.

3.6 Project Components

A project component consists of a sub-set of inputs, activities and outputs that serve a single component objective. Components may be identified on the basis of a number of possible variables, including:

- **Technical features** (i.e. a health project may have components focusing on malaria control, diarrhoeal disease, and acute respiratory infections)
- **Geographic locations** (i.e. a census support project focusing its capacity building activities on different provinces or regions and at the national level)
- **Target groups** (i.e. an HIV aids project focusing on raising awareness among schoolchildren, sex-workers, injecting drug users and health workers)

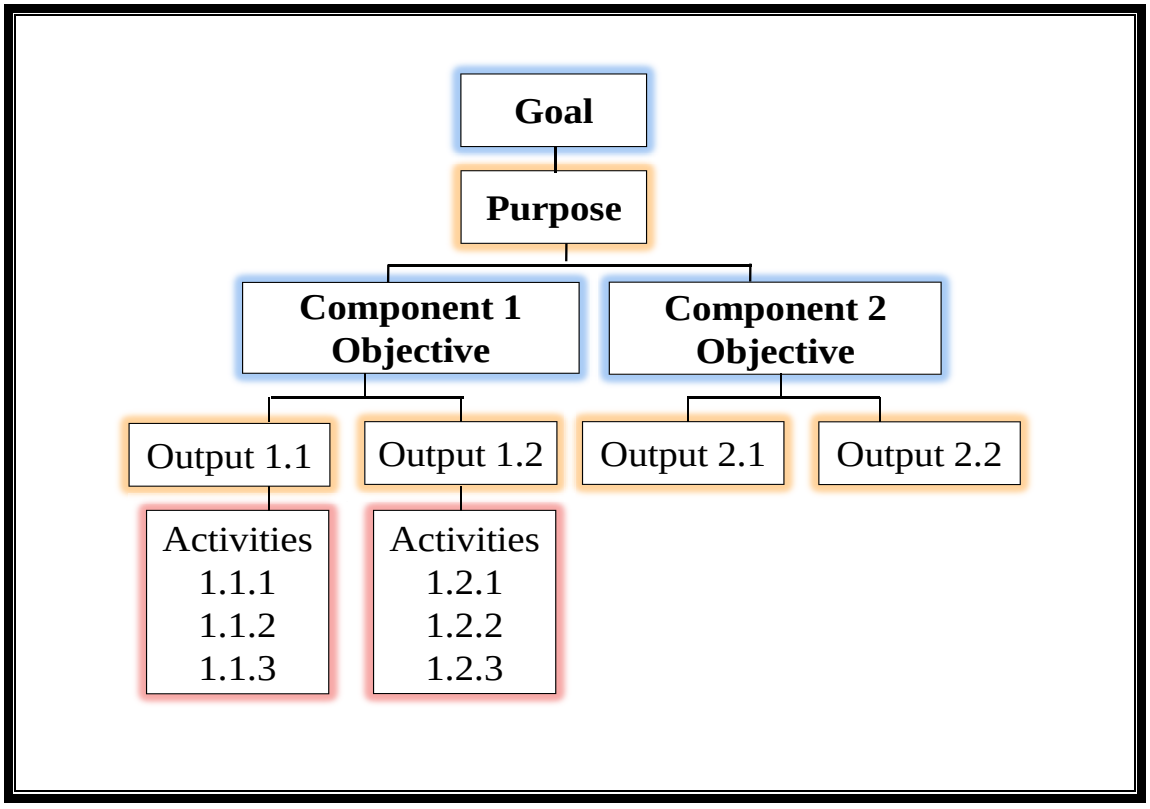
- **Management/organisational structures** (i.e. an agriculture project divided into extension, training, research and credit components to reflect the local structure of the Department of Agriculture)
- **Phasing of key project activities** (i.e. a rural electrification project which requires a feasibility study, pilot testing, and implementation and maintenance stages.

Identifying appropriate component 'headings' or 'foci' will therefore depend on a number of specific factors that are being discussed. Agreement on what the components should be is best determined through a consultative process with key stakeholders.

3.7 Reference Numbers and Flow Charts

Using reference numbers is a useful device to help the LFM user negotiate around the logic of the matrix, particularly when the matrix is presented on more than one page. This helps the reader understand which activities, outputs and purposes are linked and also provide a clear reference point when preparing activity, resource and cost schedules linked to the LFM. Use of a flow chart format to present a summary of outputs, component objectives, purpose and the goal is also a useful device. Such a format structure is shown below in **Figure 7**.

Figure 7: Project Components Flow Chart



3.8 Writing Clear Objective Statements

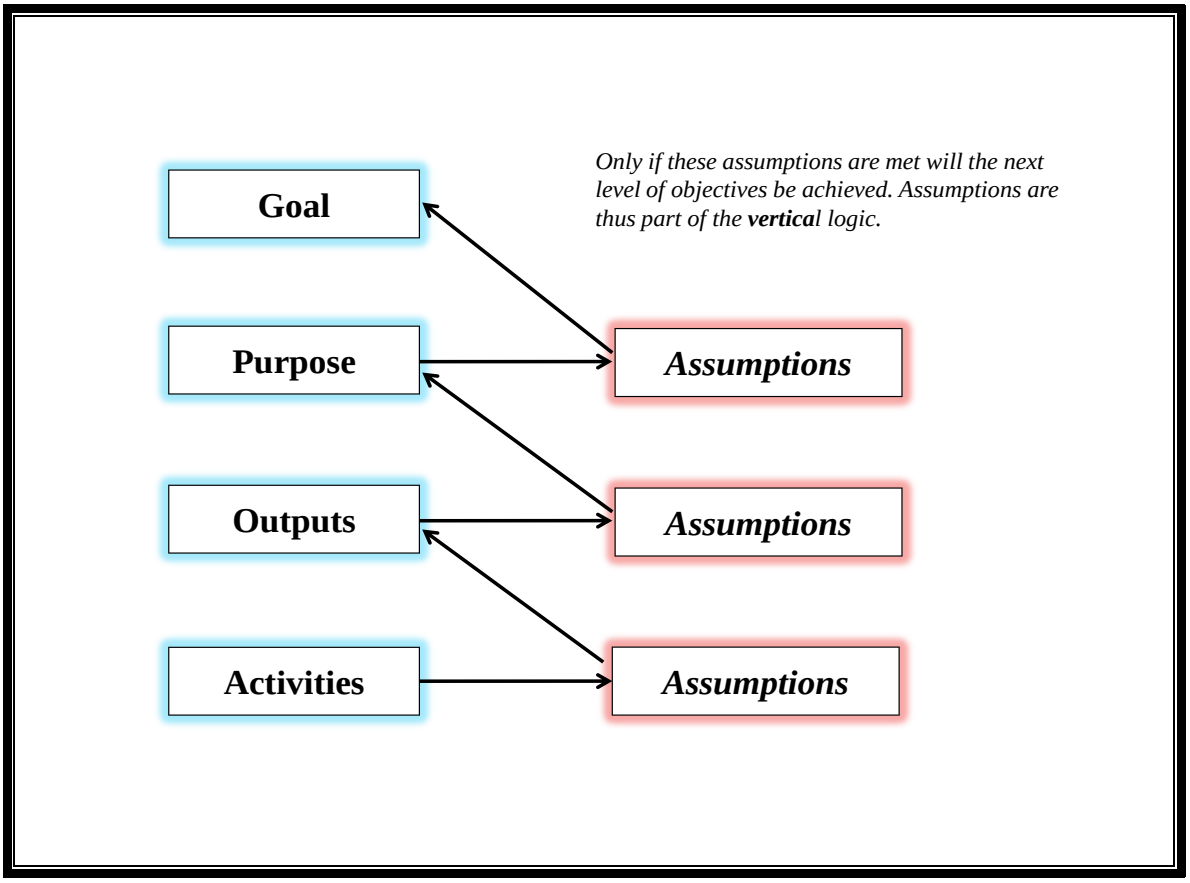
It is useful to standardise the way in which the hierarchy of project objectives are described in the matrix. This helps the reader recognise more easily what is a purpose, an output or activity statement. A convention can therefore be used whereby a goal, purpose and component objective statement is always written in the infinitive ('to do something'), an output is described in the future perfect ('something will have been produced'), and an activity is described in the present tense as an active verb ('do something'). An example of what is meant is provided below:

Goal	To contribute to improved community health on a sustainable basis
Purpose or Objective	To provide a clean, reliable and sustainable supply of water adequate for community needs
Output	A reticulated water supply will have been established and village water supply maintenance technicians will have been trained.
Activity	Conduct site survey, build header tank, prepare training materials, and design user-pays system.

3.9 Assumptions and Risks

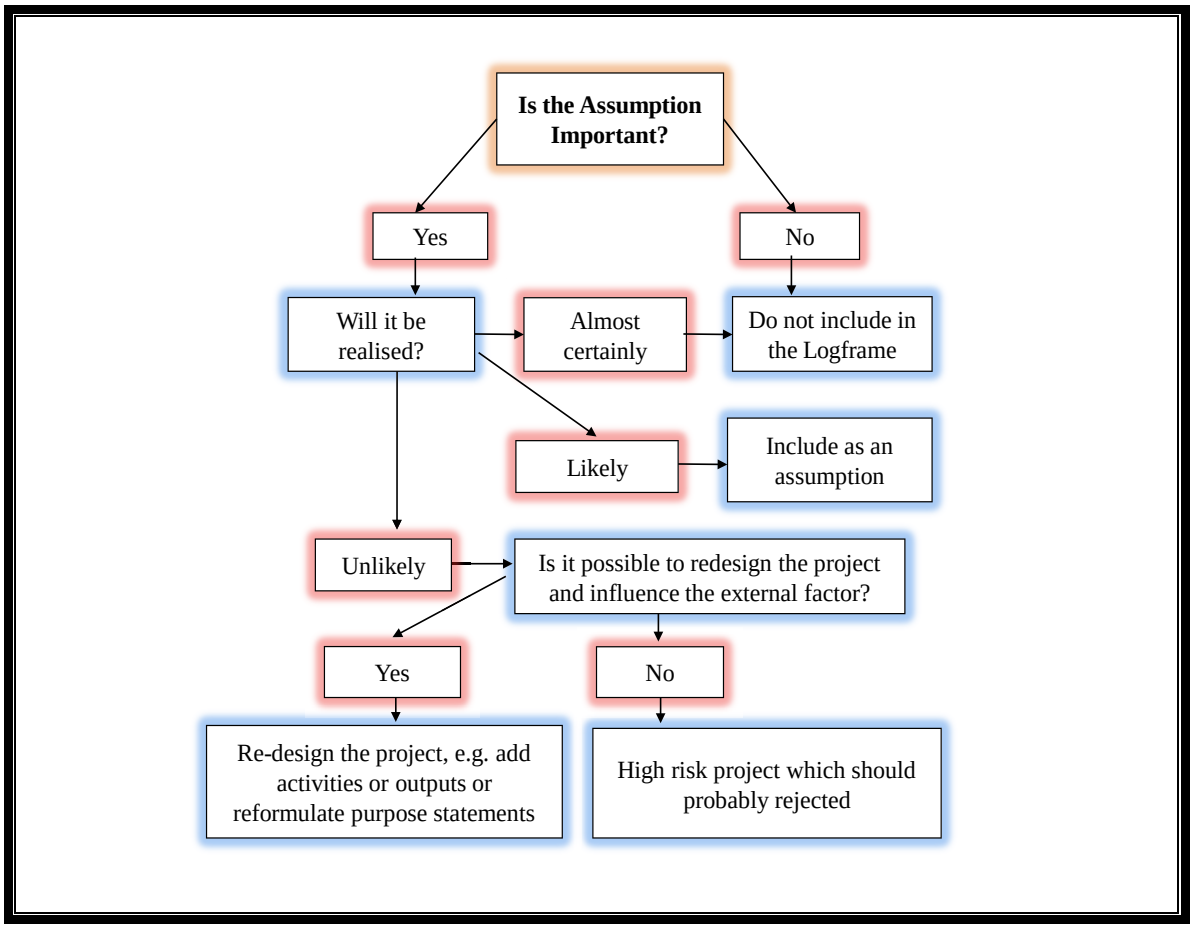
Projects are always subject to influence by factors outside the direct control of project managers. This is particularly so of rural and institutional development type projects which require the cooperation of a number of different stakeholder groups, are often implemented in poorly resourced and unstable environments, and require behavioural change on the part of participants. A project is never isolated from external events. The fourth column of the matrix is used to highlight the external conditions (assumptions) that need to be fulfilled if the vertical logic of the project description is to hold true. This relationship between assumptions and the project description is shown in **Figure 8**. Understanding and assessing the nature of these assumptions is an essential part of good design. Failure to realistically identify and address assumptions is a common source of project failure. Some LFM users prefer to talk about 'risks' in this fourth column. The distinction being that risks are ***negative*** statements about what might go wrong, whereas assumptions are ***positive*** statements about the conditions that need to be met if the project is to stay on track. Whether assumptions or risks are used, the purpose is the same, namely to assess and address external impacts on the project and improve where possible, the robustness of the design.

Figure 8: Relationship between Assumptions and Objectives



A decision tree to help analyse the importance of potential risks, and decide what should be done about them, is shown in **Figure 9** below.

Figure 9: Assumptions Decision Tree



3.10 Horizontal Logic - Link to Monitoring and Evaluation

The horizontal logic of the matrix helps establish the basis for monitoring and evaluating the project. The link between the LFM and monitoring, review and evaluation is illustrated in **Figure 10**.

Figure 10: The LFM and Monitoring and Evaluation

LFM Hierarchy	Type of Monitoring and Evaluation Activity	Level of Information
Goal	Ex-post evaluation	Outcomes/Impact
Purpose	Evaluation at completion and on-going review	Outcomes/Effectiveness
Component Objectives	On-going review	Effectiveness and sustainability
Outputs	Monitoring and review	Output
Activities Inputs	Monitoring (physical and financial monitoring)	Input/Output

3.11 Testing the Project Description

Once the project description and assumptions have been drafted (columns 1 and 4 of the matrix), the next task is to identify the indicators that might be used to measure and report on the achievement of objectives (column 2), and the source of that information (column 3). Because one reads ***across*** the matrix when analysing indicators and means of verification, this is referred to as the 'horizontal logic'. In considering how the achievement of objectives may be measured/verified, one is required to reflect on the clarity of objective statements, how feasible they will be to achieve, and how they might be more specifically defined. This is part of the iterative nature of the analysis. Each part of the framework may need to be revisited as new tests of logic are applied.

3.12 The Level of Detail

In most cases, the specification of indicators and means of verification should focus on the output, component objective and purpose levels of the hierarchy. It is usually not appropriate to specify indicators for every activity (if activities are included in the LFM), as this tends to clutter the matrix with too much detail. Activity and input monitoring systems are often better defined and established during implementation by the management team. If the goal is a broad statement of development intention at the sectoral or national level, and the project itself is providing only a small contribution, it may not be useful to include indicators and means of verification for the goal. At the design stage, the level of detail that can be

realistically expected in both the indicators and MOV columns will depend on (among other things):

- the type of project;
- the information available at the time of design;
- whether or not the team includes a member with monitoring and evaluation design skills; and
- how much time the design team has to do the work.

The horizontal logic of the matrix should be used as a means by which to:

- test the clarity of objective statements;
- indicate the type of information required and how it could be collected;
- provide a framework within which project implementers can design the detailed elements of the monitoring and evaluation system once implementation commences;
- help determine the scope and scale of resources that will be required to establish and maintain an effective monitoring and evaluation function, and then include these resources in the project design and budget.

3.13 Indicators

Indicators specify how the achievement of project objectives will be measured and verified. They provide the basis for monitoring project progress (completion of activities and the delivery of outputs) and evaluating the achievement of outcomes (component objectives and project purpose).

There are no absolute principles about what makes a good indicator of physical achievement, however the **SMART** characteristics listed below (Specific, Measurable, Attainable, Relevant, Timely) are useful.

- **Specific -** Key indicators need to be specific and to relate to the conditions the project seeks to change. Cement delivered to a site is not a good indicator of the number of houses constructed. Likewise seedlings distributed from a nursery may not be a valid indicator of plants established. The horizontal logic of the Logical Framework Matrix helps to test these criteria.
- **Measurable -** Quantifiable indicators are preferred because they are precise, can be aggregated and allow further statistical analysis of the data. However, development process indicators may be difficult to quantify, and qualitative indicators should also be used.
- **Attainable -** The indicator (or information) must be attainable at reasonable cost using an appropriate collection method
- **Relevant -** Indicators should be relevant to the management information needs of the people who will use the data.

- **Timely -** An indicator needs to be collected and reported at the right time to influence many management decisions. Information about agricultural based activities, for example, must often come within specific time periods if it is to be used to influence events in the whole cropping and processing cycle.

Where possible, indicators should incorporate elements of **quantity, quality and time**. This is about setting targets for project implementers to work towards and against which progress can then be measured. As the saying goes, "what gets measured gets managed".

3.14 Means of Verification

The different means (and costs) of collecting information must also be considered when choosing appropriate indicators. Some indicators may give the information you would ideally like to have, but when the means of getting this is carefully considered it might become impractical, e.g. too complex or expensive. The Logical Framework Matrix is a useful analytical and presentational structure for systematically identifying and assessing appropriate 'means of verification' for each indicator that is chosen.

Once it is clear what information managers might require (the key indicators) it is then necessary to consider how this might be obtained. The following questions should be asked and answered:

- **How** should the information be collected, e.g. sample surveys, administrative records, national statistics (as in the census), workshops or focus groups, observation, PRA or rapid appraisal techniques?
- **What source** is most appropriate? E.g. who should be interviewed? Has the Department of Statistics already collect the required information? Is the source reliable?
- **Who** should do it? E.g. extension staff, supervisors, or an independent team?
- **When** and how often should the information be collected, analysed and reported? E.g. monthly, annually, according to seasonal cropping cycles?
- **What formats** are required to record the data being collected?

When developing answers to these questions, one of the main issues to keep in mind is the resource and capacity constraints that will be faced by those responsible for collecting the information. There is no point designing procedures which are too complex or costly as this will merely lead to frustration and disappointment in the outcomes. A balance must therefore be struck between what would be desirable in an ideal world and what is feasible in practice.

Project staff will almost certainly need to collect some primary information specific to their project's work, but should first look to using existing sources where these are available. For the 'big picture' the Department of Statistics, research studies, international agencies' and business reports may be useful sources (these are often available). At the local level community, government and other service agency records may provide relevant planning and management information for project implementers. The main point is to build on existing

systems and sources (where possible and appropriate) before establishing new ones. Check what's already there before assuming it isn't.

3.15 Implementation, Resource and Cost Schedules

Once the Logical Framework Matrix is considered sound, the structure can then be used as a framework for preparing implementation, resource and cost schedules. These schedules should be clearly and logically linked to LFM components and outputs through the use of appropriate reference numbers. Activities leading to outputs can (as appropriate) be specified in more detail and scheduled on a Gantt chart format (implementation schedule). The inputs required for each set of activities and/or outputs can then be specified and also scheduled over time. Finally, the cost of inputs can be determined and a project budget estimate and cash flow calculated. An example of a completed LFM is given in **Appendix 1**. In the LFM, a summary of the implementation, resources and cost schedules are given. However, a more detailed Work-Plan, Materials and Equipment Plan, Personnel Plan and Budget Requirements should be prepared and when asked for details during the project examination at EPU. The Plan of Operation will consist of the following:

- Work Plan
- Materials and Equipment Plan
- Personnel Plan
- Budget Requirements.

The basic formats that can guide the preparation of these plans are given in the following tables:

Table 1: Work Plan

Activity	Sub-Activity	Year					Conditions indicating completion	Responsibility		Remarks
		2011	2012	2013	2014	2015		Name of Person /Unit	Co-operator	
1. 2. 3. 4. 5. etc		→	→	→	→					

Table 2: Materials and Equipment Plan

Item	Activity/ Sub-activity	Year					Remarks
		2011	2012	2013	2014	2015	
1. 2. 3. 4. 5. etc							

Table 3: Personnel Plan

Activity	Sub-activity	Year					Remarks
		2011	2012	2013	2014	2015	
1. 2. 3. 4. 5. etc							

Table 4: Budget Plan

Item	Sub-activity	Year					Remarks
		2011	2012	2013	2014	2015	
Development Expenditure 1. 2. 3. etc **Operating Expenditure** 1. 2. 3. etc							

SAMPLE OF A LOGICAL FRAMEWORK MATRIX SUMMARY

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS (OVI)	MEANS OF VERIFICATION (MOV)	ASSUMPTIONS
GOAL: To increase cash incomes on a sustainable basis and improve food security in the project area.	• Average annual incomes increased by 20% from year 3 for 2,400 targeted families. • Family food production increased by 15% p.a. from year 2.	• House-hold surveys • Local Market surveys • Baseline survey	Government pricing policy continues to offer adequate production incentive to farmers.
OBJECTIVE: To increase agriculture production and establish a local capacity to manage Lift Irrigation Cooperatives.	• Corn production increased by 20%. • Groundnut production increased by 25%. • Vegetable production increased by 35%. • 10 Cooperatives established by year 3. • Water charge recovery rates.	• Baseline survey • Cooperative records and sample surveys • Project records • Cooperative accounts	• Input supply scheme effectively established • Enterprise gross margins remain attractive to farmers • Cooperatives are successfully established
OUTPUTS: 1. 10 Lift Irrigation schemes established covering a command of 1,200 ha.	• Ten schemes established by year 3. • 1,200 ha. in command • Area irrigated each season.	• Engineer's completion reports. • ---------ditto---------- • Cooperative records and ag. extension quarterly reports.	• Local labour inputs are provided by the beneficiaries.
2. Farmers adopted improved varieties and practices and a new cropping pattern.	• New corn, groundnut and vegetable varieties adopted. • Quantity and type of inputs used • Change in cropping patterns	• Ag. extension worker records. • L.I. cooperative records. • L.I. cooperative records and field inspection	• Adequate and timely supply of inputs • Effective on-farm demonstrations established
3. Community capacity to manage and sustain Lift Irrigation (LI) schemes established.	• Cooperative membership and participation • Water charge recovery rates	• Cooperative meeting minutes. • Cooperative accounts	• Community cooperation is seen to bring individual benefits • Effective cooperative leadership

ACTIVITIES

1.1. Conduct initial ground surveys and discuss community commitment and responsibilities with potential beneficiaries.

1.2. Assessment of Applications.

1.3. Prepare detailed design specifications for identified schemes.

1.4. Order materials and machinery.

1.5. Lift irrigation schemes comprising construction of
- Pump houses
- Rising mains
- Distribution chambers
- Distribution pipe and valve networks

2.1. Conduct initial field visits to assess detailed input and training requirements

INPUTS AND RESOURCES

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
No. of ground surveys conducted	5	-	-	-	-	**5**
Cost (RM'000)	100	-	-	-	-	100
No. of applications received	1,000	1,000	400	-	-	2,400
No. of plans completed	2	4	4	-	-	10
Arrival of supplies and equipment (%)						
Cost (RM '000)						
Construction of Lift irrigation schemes completed	2	4	4	-	-	-
Cost at RM1.5mil/ scheme	3,000	6,000	6,000	-	-	15,000
Assessment of input supply requirements (%)	100	-	-	-	-	100
Assessment of training requirements (% completion)	100	-	-	-	-	100

- Community development workers establish effective working relationships with beneficiaries

- Farmers agree to devote time and resources to adopting new practices.

2.2. Provide appropriate on-site demonstrations and training	No of on-farm demonstration plots	2	4	4	-	-	10	
2.3. Facilitate required input supply for first 3 seasons of irrigated farming	No. of input supply businesses established							
3.0. Staff Recruitment	Civil Engineers	2	-	-	-	-	2	• Adequate budget appropriations are made. • Procurement and recruitment procedures are effectively managed. • Suitable staffs are available.
	Community Development Workers	4	-	-	-	-	4	
	Agriculture extension specialists	2	-	-	-	-	2	
	Support staff	4	-	-	-	-	4	
	Labourers							
4.0. Capital Items and Equipment	Vehicles	2	-	-	-	-	2	
	Office complex (office space, storage facilities, equipment)	1	-	-	-	-	1	
5.0. Funding	Training Funds (RM '000)	0.5	0.5	0.5	0.5	0.5	2.5	
	Operating Funds	2.0	2.0	2.0	2.0	2.0	10.0	