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# Contents

# Abbreviations and Glossary

| | |
|---|---|
| **assumptions** | Factors outside the control of the project that may affect the ability of the project to achieve its purpose and goals |
| **cause-effect analysis** | The process of identifying causes and effects of performance problems or opportunities |
| **deliverables** | Tangible outputs from the project |
| **effects** | Generally refers to the achievement of the project's purpose or immediate objective |
| **Gantt chart** | A graphical representation of sequence of activities of a project |
| **impact** | Sector impacts generally refer to sector influences on the lives of people. Project impacts generally refer to the achievement of the project's longer term goals |
| **logical framework matrix** | A matrix for documenting a project or project design |
| **MAUT** | Multi-Attribute Utility Technique - a process for choosing between possible actions |
| **MIS** | Management Information System - mechanisms for keeping track of information about a project |
| **NGO** | Non Government Organization - non-profit organizations |
| **objectives** | Desired outcomes from a project; These can be immediate (project purpose) or long-term (goals). |
| **outputs** | Products (or deliverables) arising from project inputs and activities |
| **performance indicators** | Measures of project performance |
| **risks** | Factors that may prevent a project from achieving its objectives |
| **sector analysis** | A process for identifying possibilities for improving sector performance |
| **VPI** | Verifiable Performance Indicators (see performance indicators) |

# Introduction

The logical framework (also known as "logframe" and "project framework") is presented as a conceptual and analytical tool for undertaking sector analysis, project planning, and project management. While, traditionally, the logical framework is a 16-box frame, this guide emphasizes the basic concepts and underlying processes inherent in applying the logical framework. These concepts and processes are far more important to sector analysis and project design than the mere mechanical use of the 16-box frame to describe and summarize the major elements of a project. The logical framework process is distinct from the logical framework matrix.

Thus, this guide clarifies concepts such as "objectives," "outputs," "performance indicators," "impact," "assumptions," and "cause-effect analysis." It also indicates how these contribute to the process of:

- systematically and logically analyzing sector performance,
- planning interventions, and
- monitoring project implementation.



The guide uses a simplified example from the transport sector to illustrate these concepts and processes.

Development interventions, be they policy or investment-focused, affect the lives of people very intimately and at all levels. Disciplined data gathering and conceptual analysis are needed before development interventions are commenced. The aim of this guide is to facilitate such analysis and planning.

# Overview of the Process

The logical process covered by this guide starts with the analysis of a sector and ends with the design of a project or program intervention using the logical framework. A brief overview of this logical process is presented below, step by step.

### *Step 1:* Assess Sector Performance

Sector performance is assessed by using performance indicators that reflect the contribution of the sector to the larger economy and to the quality of life of people. Examples of sector indicators are "mortality" for the health sector, "productivity" for the industrial sector, and "traffic flows" for the transport sector. Each sector has its own set of indicators which, taken as a whole, reflect the performance of the sector.

### *Step 2:* Identify Sector Performance Problems/ Opportunities



Problems or opportunities are identified as issues of concern. Such problems or opportunities are identified in relation to a specific sector performance indicator. Examples would be "rising mortality rates" or "deteriorating productivity" or "increasing traffic congestion".

### *Step 3:* Cause-Effect Analysis of Problems/ Opportunities

A core problem or opportunity is selected to improve sector performance. It is analyzed to identify the causative factors as well as consequent effects. It is usually diagrammatically presented in the form of a cause-effect tree. The effects of the problem indicate its wider dimensions and impacts on the economy. The causative factors identify the variables influencing the problem/opportunity and provide the basis for solution.

### *Step 4:* Objectives Tree

The cause-effect tree is converted into an objectives tree, thereby providing the spectrum of possible actions that can be taken to address the problem or opportunity.

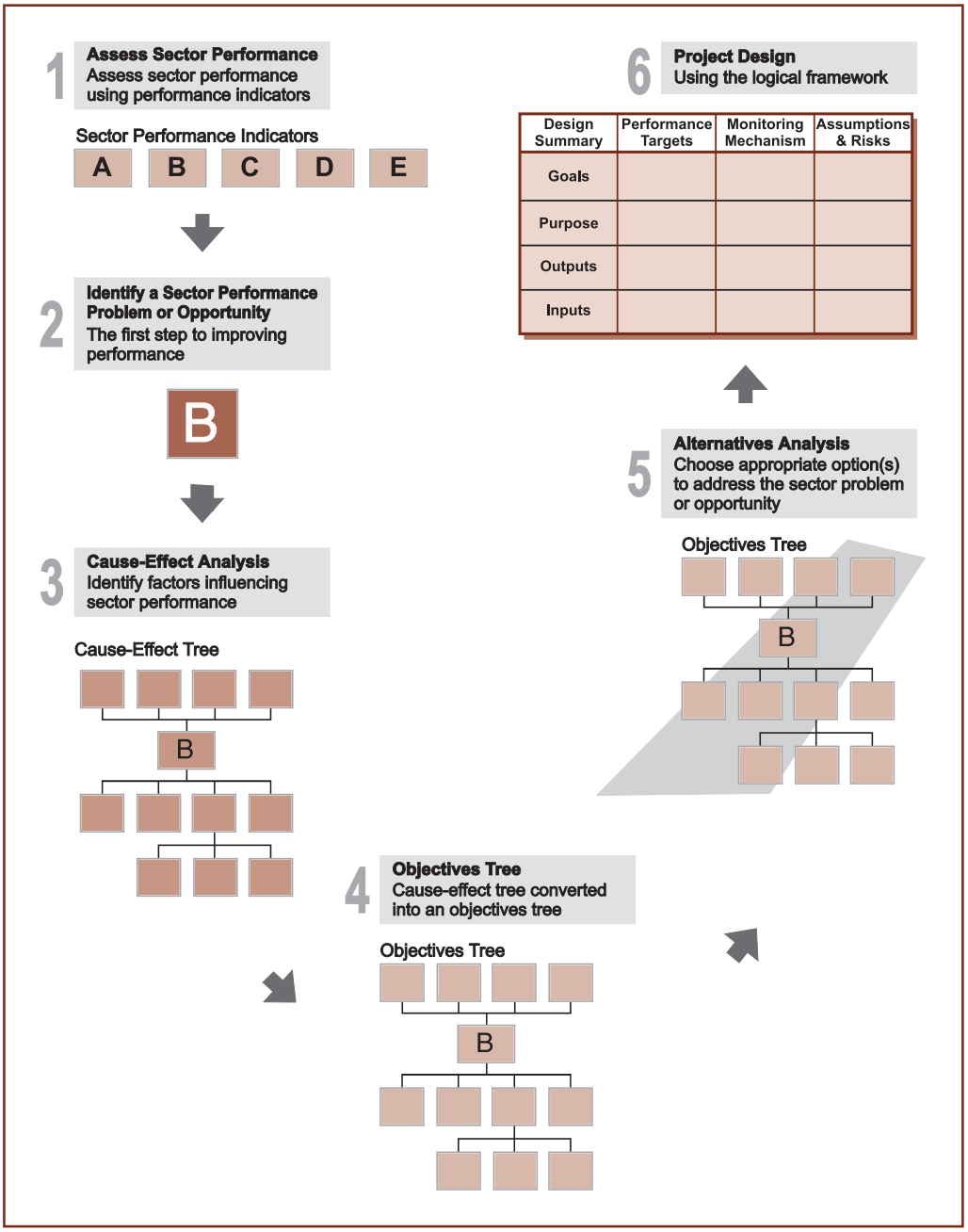
### *Step 5:* Alternatives Analysis

Various courses of possible actions are derived from the objectives tree, all aimed at improving sector performance for the performance indicator being analyzed. The options are assessed against each other using specific criteria, leading to the choice of the most appropriate (efficient and effective) option in the circumstances.

### *Step 6:* Project Design Using the Logical Framework

The chosen course of action is translated into a logical framework that provides the basic design of the project or program in terms of its intended objectives, outputs and activities.

## Figure 1: The Project Design Process



# Part 1: Assess Sector Performance

Sector assessment is the process of identifying opportunities for improving performance of a sector.

## Defining a Sector

What is a sector? For instance, are highways and railways sectors in their own right, or subsectors of the transport sector?

**Baume & Tolbert (1985) define a sector as follows:**

> *Analytically, a sector is a matter of aggregation and it can in principle be fixed at any intermediate point between the individual project and the national investment program. Thus, the definition of a sector is largely a matter of convention and convenience. In practice, there is considerable agreement as to what a sector is. A sector comprises, for the most part, the producing or operating units in the economy that have a common function or output.*

Baum, W.C. and S.M. Tolbert, *Investing in Development - Lessons of World Bank Experience*, New York: Oxford University Press, 1985.

Thus, sectors are segments of the economy, identified in terms of their contributions to the economy and daily quality of life. Policies and regulations from government institutions contribute to regulating and administering each sector.

Typical sectors critical to the economy of a developing country are finance, industry, education, health, energy, transport, telecommunications, water, and agriculture.

All of these sectors contribute in varying degrees to the standard of living and quality of life of a country's citizens. They also contribute to the development of the overall economy. The significance of each differs from country to country. In less developed countries for instance, the role of the agriculture sector is critical. In more developed countries, this sector is less significant whereas telecommunications, transport, and industry may be more crucial.

The role of development planners and managers is to clarify and manage the role and contribution of each sector to the economy. They achieve this through careful management of policies, services, and investments within each sector. One typical intervention is a *project* or a *program,* often supported by external bilateral and multilateral development agencies.

## Sector Performance

The purpose of a sector assessment is to identify opportunities for enhancing sector performance. The task of the project planner is to make sure that sector policies, investments, and services

- benefit sector performance; and
- use time, money, and opportunity efficiently.

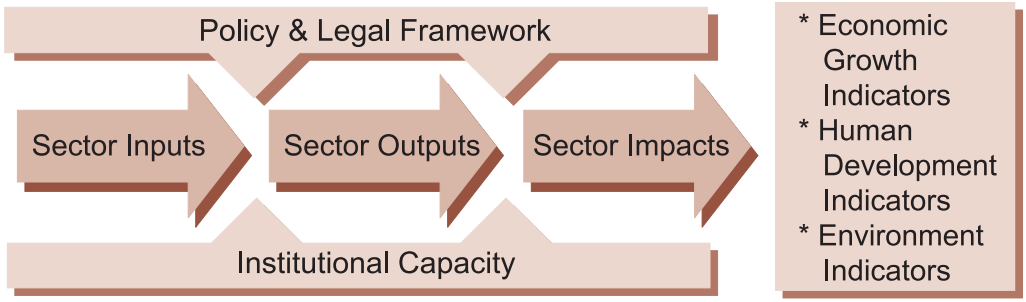
Successful sector management requires a system to analyze its efficiency and effectiveness as well as plan interventions if sector performance needs improvement.



Figure 2 provides an overview of the interrelationships between various factors influencing sector results. Systematic sector analysis requires an understanding of these factors and their causal links.

Sector performance can be measured at several levels. At its highest level, sector performance is reflected in specific **impacts** that in turn influence the status of the overall national economy. For example, exports of the agriculture sector will contribute to the current account status, and an educated workforce will contribute to growing productivity.

**Figure 2: Interrelationships within a Sector**



These impacts arise from another level of sector performance — sector **outputs**. The outputs are the tangible goods and services delivered by public and private institutions operating within the sector. New agriculture technologies, a road network, and education facilities are examples of sector outputs.

The ability of sector institutions to deliver sector outputs is in turn influenced by the **policy and legal framework** operating within the sector and the economy as well as the **institutional capabilities** (effectiveness and efficiencies) of the sector.

Finally, the **inputs** of financial and human resources devoted to the sector, by public and private institutions, are also key variables influencing sector outputs.

## Sector Impacts

### Overview



Each sector contributes, in varying measure, to the quality of life of its country's citizens and to the overall growth and development of the economy. For example, the energy sector provides power supply to industry, entertainment, and daily life. The transport sector provides the physical infrastructure and facilities for moving people and goods between points. This facilitates industrial and agricultural production, trade, social activities, and cultural exchange. The name given to such contributions to the economy is *sector impacts*.

These sector impacts arise not only from the policies and regulations controlling the sector but also from the goods and services delivered by public and private institutions operating within it.

They also reflect the relative significance of a given sector to people's lives and to the overall social and economic progress of the country. Sector impacts provide a tool for planning sector and institutional performance and monitoring, managing, and finally reporting on it. This performance focus leads to improved management. It also becomes the basis for allocating scarce resources among sectors, based on how effectively each is managed and on their relative performance in contributing to the economy.

## Measuring Sector Impacts

Sector impacts must be measurable and monitorable so that the person responsible for a project intervention can decide when and how to influence them. Performance indicators provide a means to measure and monitor impacts. These indicators essentially reflect quantitative and qualitative aspects of impacts at given times and places. They thereby enable measurement.

Typically, between five and ten key impact indicators, depending on their nature and diversity, can adequately represent a sector's overall performance. Table 1 provides a sample of such impact indicators by sector.

**Table 1: Sector Impacts**

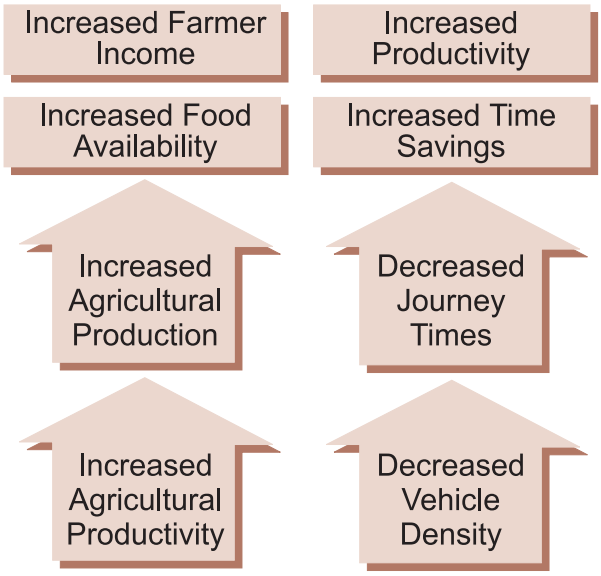
| Sector | Sample Sector Impacts |
|---|---|
| **Agriculture** | • farmer income<br>• agriculture production<br>• agriculture productivity<br>• share of work force<br>• agriculture share of GDP |
| **Transport** | • vehicle usage/density<br>• journey times<br>• safety<br>• transport share of GDP |
| **Health** | • infant mortality rate<br>• life expectancy<br>• population growth<br>• health status (morbidity)<br>• productivity |
| **Education** | • enrollment rates<br>• literacy<br>• work force education level<br>• absorption rates<br>• productivity |
| **Energy** | • capacity utilized<br>• consumption<br>• access to electricity<br>• average cost to customer |

Some of the indicators inherently include quantitative and qualitative dimensions that allow for monitoring and performance assessment. For example, *farmer income* and *literacy rates* can be directly measured and monitored. Other indicators require further definition because they are not readily measurable. For example *health status* must be further defined by *morbidity and mortality rates* and *road safety* further defined by the indicator *number of accidents/deaths per period*.

## Hierarchy of Impacts

Sector impacts often comprise varying levels, with one level influencing the next. Every sector therefore has a hierarchy of impacts to clarify and manage sector performance. See Figure 3 for examples of the hierarchy of impacts.

**Figure 3: Examples of Impact Hierarchies**




Understanding this cause-effect linkage between impacts is important. It enables sector planners and managers to identify potential interventions at a primary impact level. This in turn influences (causes) consequent and longer-term impacts on the sector and the economy.

Generally, institutions that manage a sector can influence but never completely control sector impacts. The reason for this is that impacts are subjected

to variables and influences, many of which are outside the control of such institutions. For example, the Department of Agriculture can ensure that an appropriate policy framework is in place and that agriculture inputs are available at competitive prices. However, the farmer controls production and productivity, and the farmer is influenced by external variables and influences such as output prices, market access, and personal motivation. Similarly, sector institutions can influence but never completely control impacts such as life expectancy, road safety, and literacy.

Managing sector impacts therefore implies:

- identifying the critical impacts important to society and the economy,
- specifying monitorable indicators for these impacts,
- assessing sector performance against these indicators so problems can be identified and corrected and improvements addressed , and
- changing those variables within our control that influence impacts.

**Verifiable Performance Indicators**



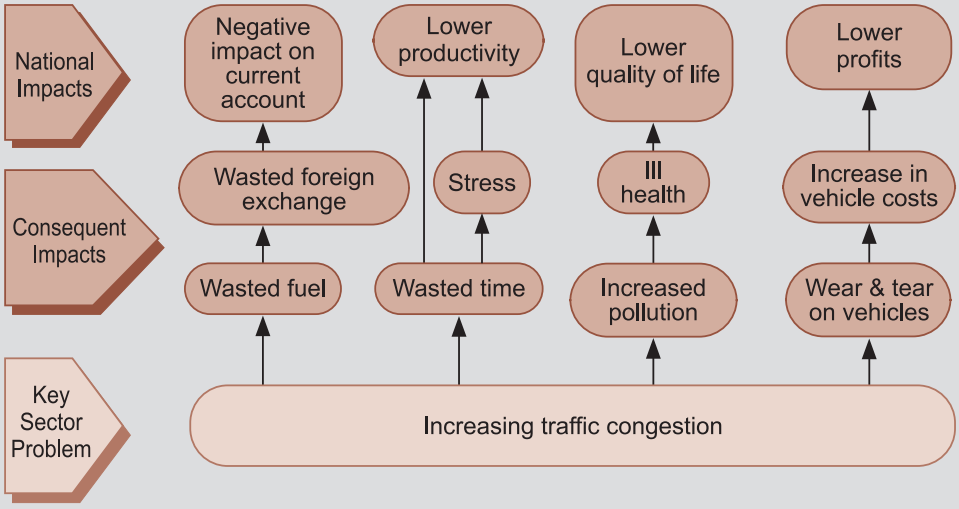
Verifiable performance indicators define sector performance objectives to be attained. They force us to specify:

- what we want to achieve in a sector;
- how we will recognize success;
- evidence of the level of sector performance in terms of
  - quantity ..... how much?
  - quality ..... how well?
  - time ..... by when?
  - location/area ..... where? and
- a basis for monitoring and evaluating the sector.

Example 1 illustrates the hierarchy of impacts and the relationships between impacts and performance indicators in the transport sector.

### *Example 1: Hierarchy of Impacts in the Transport Sector*

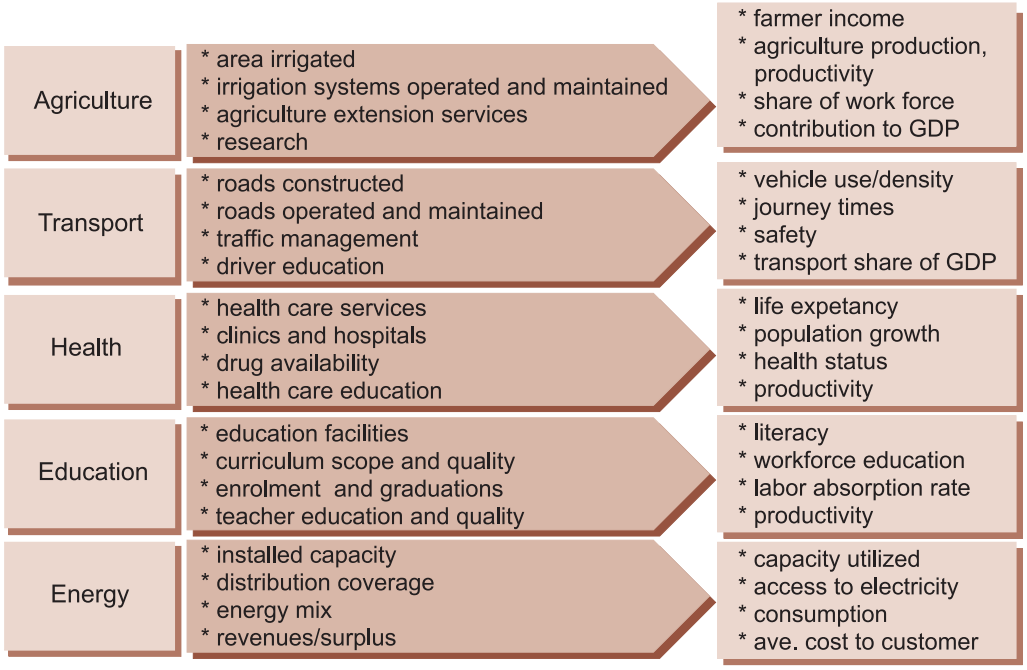
*Traffic flows and related congestion* is a key sector indicator in the transport sector. It is significant due to its ripple effect upstream in the local and national economy. When traffic flows increase smoothly, many of these impacts are beneficial, such as easier access, greater movement of goods, increased trade, and more investment. However, there is a point at which increased traffic flows begin to cause traffic congestion. This sets off an alternate set of impacts: increased fuel consumption; increased travel time (plus its related costs to the economy); increased fuel-generated pollution; increased wear and tear of vehicles. These impacts have a domino effect at both the sector and national levels. *Traffic congestion* may therefore be a significant sector performance problem that deserves our attention.



## Sector Outputs

Sector outputs are essentially the whole spectrum of goods and services offered by a sector, which in turn cause and influence sector impacts (see Figure 4). These goods and services are also called the "**deliverables**" of a sector.

**Figure 4: Typical Sector Outputs and Impacts**




Sector goods and services can range from directly consumable items through to intermediate products, from roads and irrigation systems to health services and education facilities.

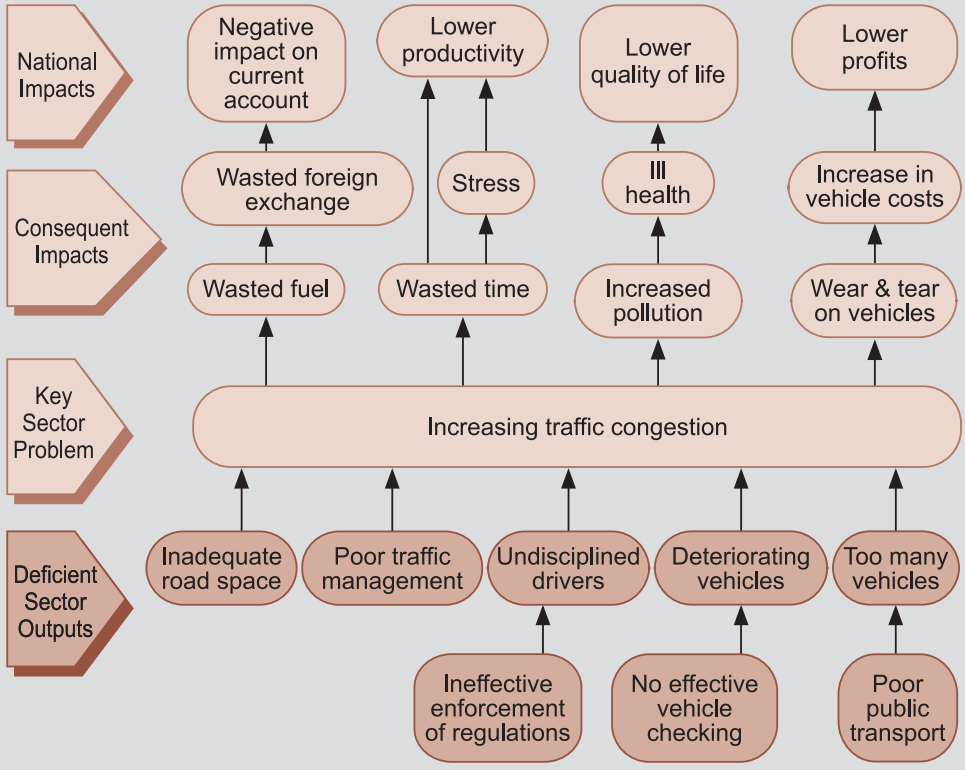
Some outputs directly generate impacts. For example, roads encourage traffic between areas and thus generate trade. Some outputs need to be combined with other outputs to support the delivery of impacts. Thus we need irrigation combined with an effective seed distribution system to enable farmers to produce. We also need an effective teacher training program combined with good education facilities to help achieve the literacy and education impacts necessary to move the economy forward.

Sector outputs are generally more under the control of public and private institutions than are their consequent impacts. Outputs are the direct result of planned human effort. They are the immediate level of physical results on which an institution's performance is gauged for a specific time period. However, they cannot and should not become the *raison d'être* of the institution. A public works department does not exist simply to build roads. It exists to facilitate movement of goods and people for economic and social objectives. These are the impacts that give significance and meaning to the institution's outputs.

Example 2 demonstrates the linkages between sector outputs and sector impacts in the transportation sector.

***Example 2: Cause-effect analysis in the transportation sector***

Applying cause-effect analysis to the traffic congestion example helps identify which sector outputs could be responsible for the problem.



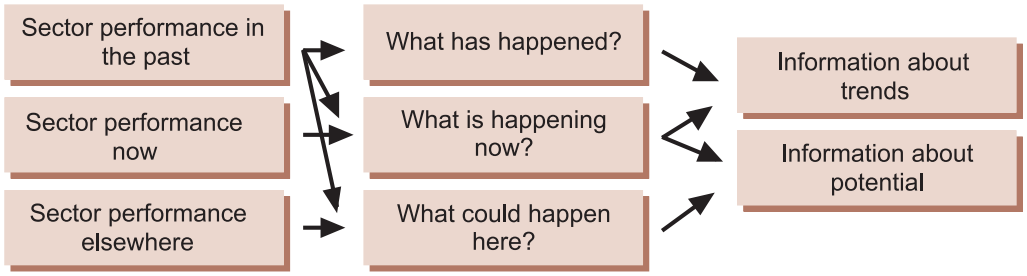
## Using Benchmarks to Monitor Sector Performance

Sector performance is represented by sector outputs and consequent impacts. Both outputs and impacts can (and should) be monitored on a continuing basis. As the saying goes: "If you can measure it (and monitor it) you can manage it".

Benchmarks provide a basis for comparisons and therefore a basis for making a judgement on the quality of performance (see Figure 5). Benchmarking involves establishing comparison criteria to enable you to answer the following questions:

- What are the trends in this sector?
- How does current performance compare with the trend?
- What is the potential of this sector?

**Figure 5: Information Provided by Benchmarking**






Public and private sector institutions use benchmarking extensively to establish standards for performance, monitor efficiencies and effectiveness, and identify performance problems.

Table 2 provides an example of comparative benchmarks and shows how one sector's indicators allow us to compare the quality of life in similar cities in the region. This provides a basis for identifying opportunities for intervention showing us some possible sector performance improvement opportunities. For example:

- the percentage of children in secondary schools in Dhaka is much lower than that in other cities,
- the ambient noise level in Karachi is substantially higher than that in other cities,
- the average traffic speed in Manila is about half that in other cities, and
- infant mortality is particularly high in Dhaka.

**Table 2: Sample Quality of Life Benchmark Indicators**

| Indicator | Calcutta | Dhaka | Karachi | Manila |
|---|---|---|---|---|
| **Poverty** | | | | |
| Incidence *(% of pop)* | 33 | 50 | 30 | 15 |
| % income spent on food | 60 | 63 | 43 | 38 |
| **Environment** | | | | |
| Floor space/person *(m2)* | - | 3.7 | 7 | 12 |
| House price/ income | - | 6.3 | 1.9 | 2.6 |
| Air pollution *(average days over acceptable level):* | | | | |
| (a) particulates *(ppm)* | 268 | - | - | 180 |
| (b) $SO_2$ *(tons/year)* | 25 | - | - | 24 |
| **Social** | | | | |
| % with water service | 64 | 65 | 83 | 75 |
| Hours of water supply/day | 10 | 6 | 4 | 16 |
| % solid wastes collected | 60 | 50 | 36 | 82 |
| Ambient noise level on scale 1-10 | 4 | 4 | 9 | 4 |
| Infant deaths/1000 live births | 46 | 108 | 65 | 36 |
| % children in secondary school | 49 | 37 | 65 | 67 |
| Public safety *(murders/1000 pop)* | 1.1 | 2.4 | 5.7 | 30.5 |
| Telephones/1000 pop | 2 | 2 | 2 | 9 |
| Average traffic speed at rush hour *(km/hr)* | 21 | 34 | 28 | 12 |

Without this kind of information we have no objective way of knowing where there is an opportunity for improvement.

Using available data is the key to both benchmarking and monitoring sector performance. This involves establishing appropriate data collection and reporting systems. For measuring and monitoring the broad benchmark indicators in Table 2, a number of international sources are available. For benchmarking, the data available for each region, country, or city must be comparable. Therefore, the use of an international source of data, such as the United Nations Development Program and World Bank, is most important. For benchmarking at a sector level, data may be sourced from specialized agencies such as the Food and Agriculture Organization (for agriculture); the World Health Organization (for the health sector); and the United Nations Educational, Scientific and Cultural Organization (for the education sector).

Benchmarking is also useful for examining interregional trends and differences. National statistics are necessary for intranational benchmarking and monitoring of sector performance. When using national statistics to measure sector performance, we must be aware of the appropriateness of the particular statistic(s) being used, its reliability, availability, and timeliness. When examining annual trends, it is necessary to ensure that the data are comparable across the whole period, i.e., ensure that data collection has been continuous and that definitions have not changed.

Sector managers are generally responsible for monitoring and using sector impact and output information. Managers range from those responsible for sector policy to those who deliver the sectors' goods and services. Regulatory authorities, government departments servicing the sector, private bodies, and individuals who produce goods and services all contribute to monitoring key sector indicators.

The purpose of such monitoring is to help each institution assess whether it is playing its appropriate role in facilitating the delivery of outputs and the achieving of impacts.



## Sector Inputs

Sector inputs are the resources required to deliver sector outputs.

Sector inputs are typically:

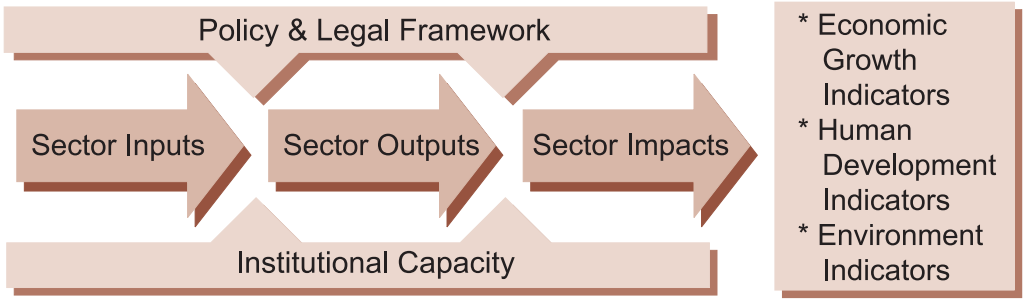
- human resources, particularly skilled resources (including specialist consulting inputs);
- technology such as equipment and work processes; and
- finance, both public and private.

Resist the easy and ever-present temptation to use *input* indicators to reflect sector performance. Government departments frequently report performance on the basis of money spent as a percentage of budget allocated. Even development finance agencies often use the indicator of *approvals* and *disbursements* to reflect organizational performance.

## Sector Policy and Institutional Framework

Sector impacts, outputs (goods and services), and inputs are generally and substantially influenced by the policy and legal framework, and by the organizational or institutional framework managing the sector (Figure 6).

**Figure 6: Influences of Sector Policy and Institutional Framework**

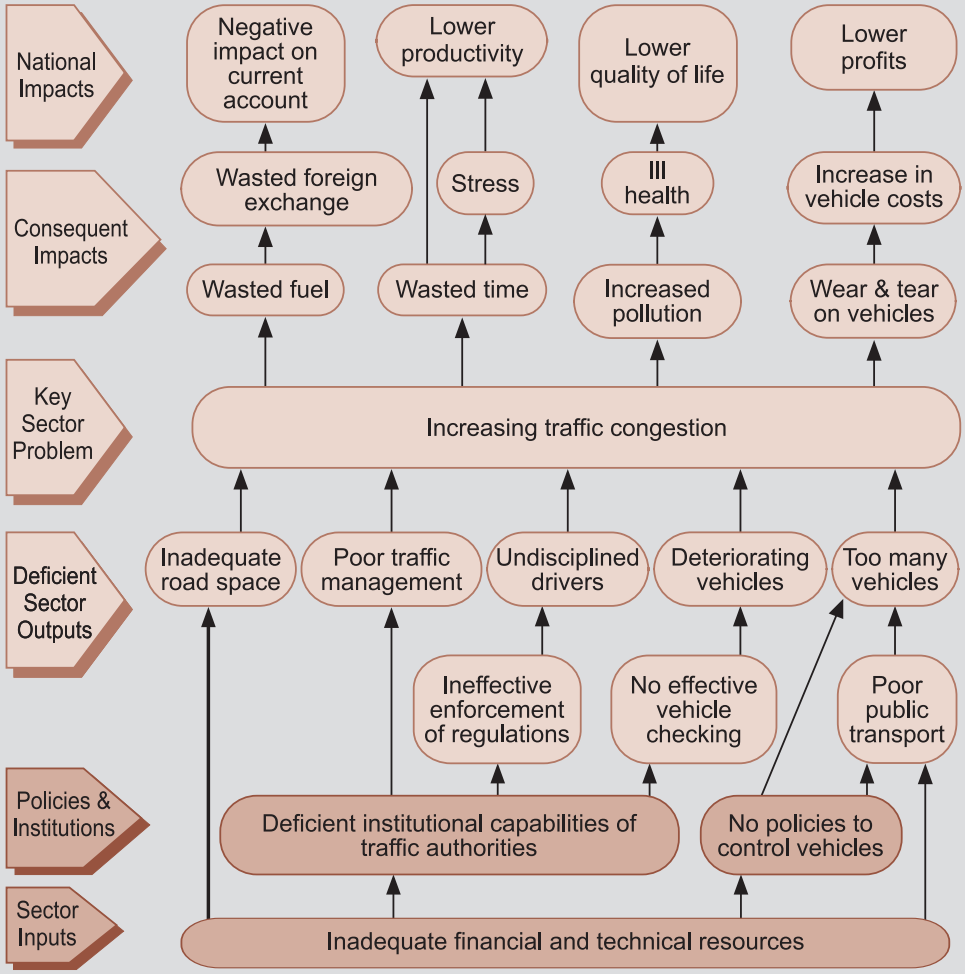



*Policy and Legal Framework:* Specific public sector institutions are responsible for putting in place and managing the policy and legal framework governing the sector. The policy and legal framework creates an environment that substantially influences the availability of inputs, the efficient production of outputs, and the significance of the expected impact. Policies can make dramatic changes to inputs such as the availability of technology or private sector investment. They can also change the demand-supply situation of sector outputs. Outputs such as reasonably priced energy and an adequate installed capacity and distribution network are essential to achieve the impacts of a productive industrial sector.

*Institutional Framework and Capacity*: In this context, institutional capacity refers to the capacity of public, private, and community-based institutions to support and promote the development, progress, and social well-being of the people they serve. The question is: given available inputs - financial, technological, and human skills - are the concerned institutions capable of efficiently and effectively converting these into outputs? Institutional capacity is therefore a key prerequisite for achieving the quantity and quality of outputs in a sector. This applies equally to public, private, and community-based institutions. Some sectors have a predominance of public institutions and the extent of the public-private involvement is generally defined by the policy framework.

***Example 3: Influence of capacities in the transportation sector***

Further cause-effect analysis reveals the influence of institutional capabilities and policies on key outputs such as “traffic management” and “number of vehicles on the road”. It also shows the role of inputs such as financial and technical resources and their influence on sector outputs.



## Cause-Effect Linkages

The Cause-Effect analysis shows the hierarchy of causes and effects from sector inputs to sector outputs through to sector impacts. The sector policy and legal framework as well as the institutional capacities in the sector significantly influence the extent of achievement at each level of this hierarchy. This cause-effect linkage is depicted in Figure 7.

The causal links represent the hypotheses about how an output or impact at one level causes further impacts at a higher level.

The relative influence of each output on the performance of the sector usually differs, with some outputs having a greater impact than others.

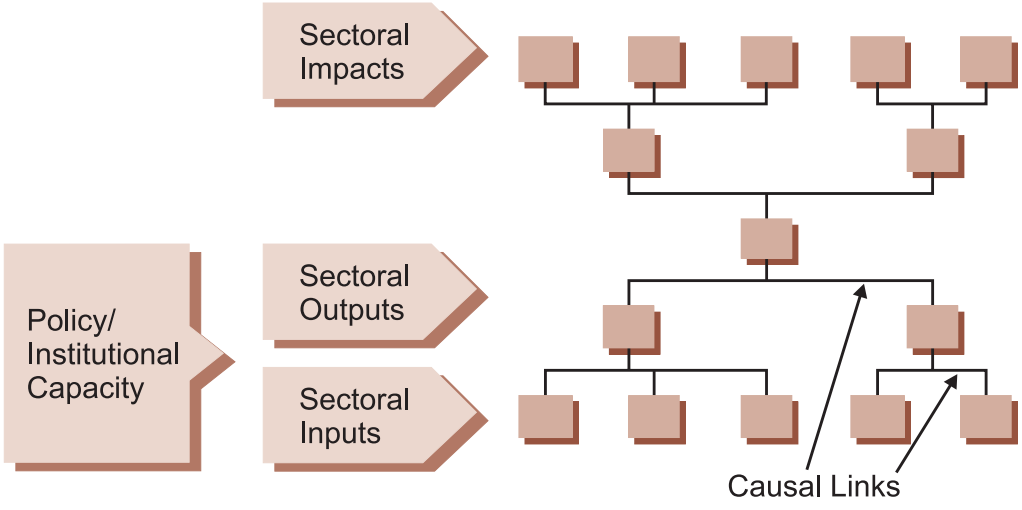
Similarly, the impacts of the sector are not of equal significance to the overall sector or the economy at large.

Thus, each causal link must be verified and, if proven accurate, clearly identify an opportunity for improving sector performance.

Some key questions must be considered in the effective use of the cause-effect analysis.



**Figure 7: Cause-Effect Linkages within a Sector**



*(i) Where do you start a cause-effect analysis? What is the trigger?*

One trigger is usually a sector impact *problem*; in the example, this was *increasing traffic congestion*. It could just as well be *increasing pollution*, or *decreasing industrial productivity*. Another and more positive type of trigger is an *initiative to improve* sector performance on a particular performance indicator. Examples of such initiatives include:

- increase food production,
- improve access to clean water,
- increase access to good quality education, and
- increase private sector investment in a particular sector.

*(ii) How to identify where inputs stop and outputs begin and where outputs stop and impacts begin? Is it important to know these distinctions?*

The easiest way to distinguish between impacts and outputs is to remember that outputs are tangible deliverables. They are the physical goods and services produced by public or private sector institutions. Impacts are the effects of those goods and services. Thus, a water supply system and the water it delivers are outputs. Access to such water and the benefits derived from the access (such as improved health) are impacts. Inputs are generally the financial, human, and technological resources used to deliver outputs. A cause-effect analysis will clearly identify these causal influences.



It is important to understand and make explicit these influences so we know clearly the hypotheses on which project and program investments are made. Thus, what outputs need to be strengthened or increased to achieve intended impacts? And, what is the input cost of each of these outputs?

*(iii) The links from one level to the other are hypotheses that need to be verified. How are they verified?*

Experienced sector specialists, in consultation with key groups of stakeholders who have a detailed knowledge of the sector, may work together to develop a cause-effect analysis. Each cause-effect link identified in the analysis is in fact a hypothesis. Verify these hypotheses by checking them on a sample basis.

The transport example contains a number of hypotheses to be verified. One hypothesis is that pollution is caused by traffic congestion. Another is that poor traffic management is a more significant cause of traffic congestion than

inadequate road space. The process of verifying hypotheses also identifies the relative levels of influence of each of the identified variables.

The verification process involves observation, physical measurement, and stakeholder consultation.

*(iv) How to decide where to locate a point of intervention to improve sector performance?*

Locate the point of intervention by:

- identifying the most important sectoral concerns;
- checking at what level these can be influenced through policies, goods, services, investments and institutions; and
- using this as your starting point.

For example, to influence income levels of a group of people, identify the point in the cause-effect chain that allows a tangible intervention which influences income levels. This may require a combination of interventions.

## Converting the Cause-Effect Tree into an Objectives Tree



The cause-effect tree that emerges from a cause-effect analysis is used as a basis for planning and designing appropriate program and project interventions. These interventions must focus on resolving performance problems or enhancing the current level of performance. To achieve this, the cause-effect tree must first be converted into an objectives tree.

*Step 1:* Convert or restate the problem or negative statements of a cause-effect tree into objective-type positive statements of the objectives tree. These statements should be desirable and realistically achievable. Thus, in our example, "increasing traffic congestion" will be restated as "smooth traffic flow."

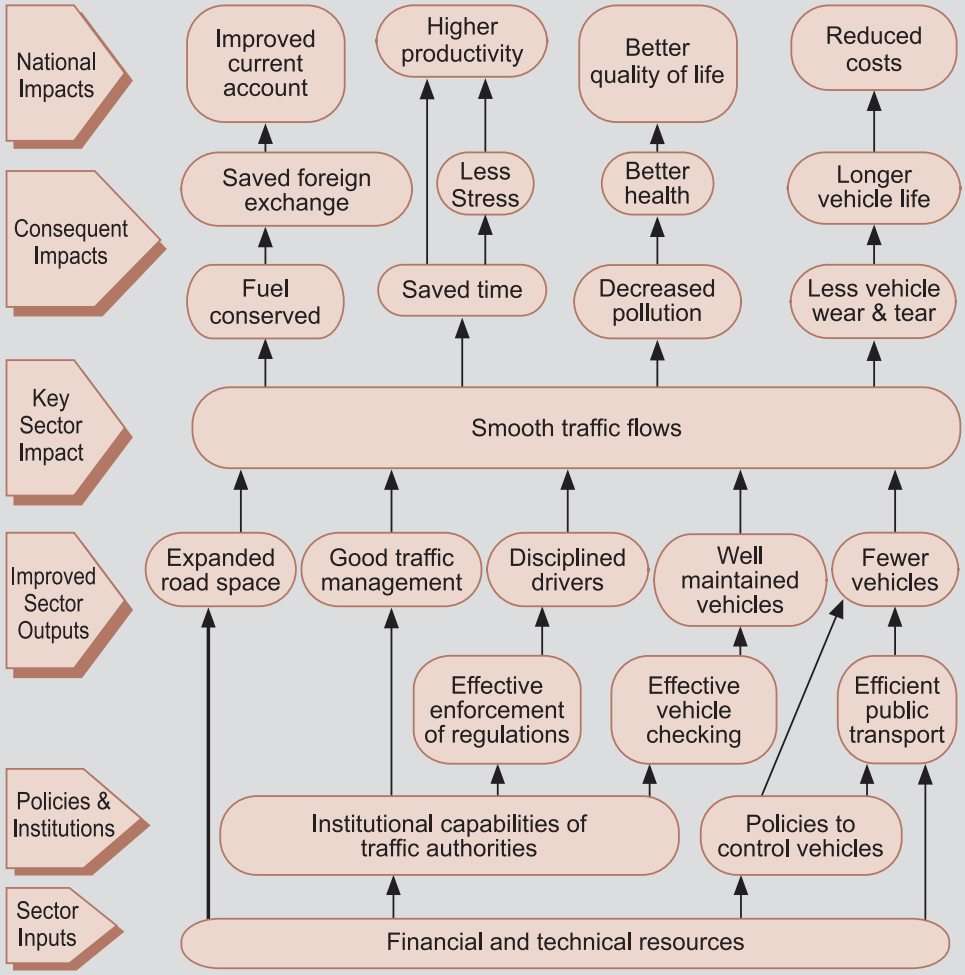
*Step 2:* Examine the means-ends relationships thus derived, and ensure validity and completeness of the diagram.

*Step 3:* Revise the objectives-statements if necessary. Add new objectives-statements if these appear relevant and necessary to achieve the stated objective at the next higher level. Delete objectives that do not seem to be expedient or necessary.

The completed objectives tree will help to identify alternative actions and investments necessary to address the central problem (or opportunity) and the consequent impacts of addressing this central problem (or opportunity).

***Example 4: An objectives tree in the transportation sector***

When the three steps are applied to the transportation example, the following objectives tree results:



## Alternatives Analysis: Choosing between Interventions

The previous examples demonstrate that numerous courses of action could be taken to improve performance. However, due to limited resources, not all can be accomplished simultaneously; hence choices have to be made. This requires prioritizing. For instance, one option is to focus simply on the policy of reducing traffic by introducing disincentives such as:

- stricter registration requirements,
- increased sales tax on cars or on gasoline, and
- tighter regulations on the use of vehicles in selected congested city areas.

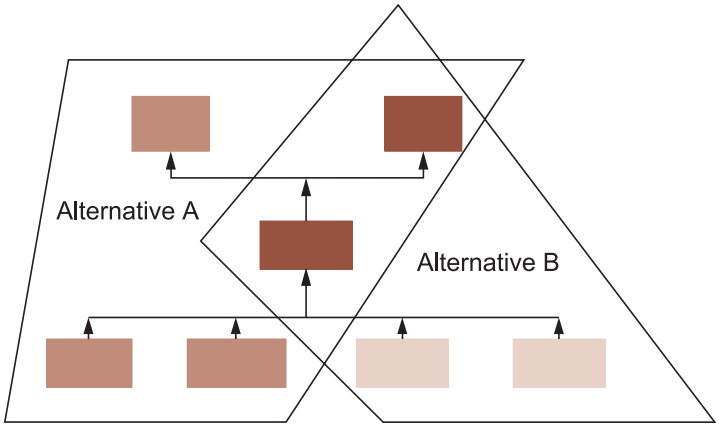
An alternative option is to focus on the management of traffic through the stricter enforcement of regulations, traffic education programs, and upgrading the traffic management system.

One helpful tool for deciding between possible interventions and developing the scope of a project is the Multi-Attribute Utility Technique. This is more commonly called an **Alternatives Analysis**. The analysis involves:

- identifying the longer term impacts and objectives you wish to pursue (desirable and achievable);
- identifying the differing means and ends ladders as possible alternative project strategies or project components; and
- assessing which alternative or mix of alternatives represent an optimal project strategy to enhance performance.



**Figure 8: Alternatives Analysis**



To help make a rational choice between alternatives, or at least to prioritize them because they may not be mutually exclusive, the development analyst must first document the criteria to be used to decide or prioritize. Typical criteria used are:

- probability of achieving the desired objectives;
- technical and institutional feasibility (implementability);
- financial and economic feasibility (cost-benefit analysis);
- social and political feasibility;
- resources available; and
- linkage with or contingency on other related initiatives.

These criteria need to be weighted in terms of their importance and significance. This is usually done using a scale of 1 to 10, with 10 signifying the highest level of significance.

All options must be scored against each criterion with the best option scoring the highest. The options need not be mutually exclusive. The comparative analysis provides an understanding of the value of each option in achieving the desired objectives.



The process is:

- identify criteria and assign weights to them on a scale of 1 to 10;
- identify the options;
- collect data to allow you to compare each option against each criterion;
- score each option against each criterion on a scale of 1 to 10;
- multiply the score (against each criterion) with the weight (of that criterion) to obtain the weighted score of each option on each criterion;
- add the weighted scores for each option; and
- identify the options with the highest scores.

The analysis is simple. Collecting the data is not. How is the relative contribution that a change in driver discipline will make to traffic congestion assessed? Any method used must make that assessment anyway. This technique simply provides a way to document the assessments. Refer to Example 5 for a demonstration of this process on our transport case.

The result of the analysis is an identified investment opportunity. The next step is to plan a project to make the best use of that opportunity.

***Example 5: Performing an alternatives analysis in the transportation sector***

This table was derived by applying an alternatives analysis to the options revealed in the objectives tree.

**Project Purpose: Ensure Smooth Traffic Flows (Reduced Traffic Congestion)**

| Criteria | Relative Weight | How well does each alternative perform against each criteria? Which one gets best score? | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | OPTIONS | | | | | | | | | | | |
| | | Road Expansion | Score | WT SC | Traffic Management Improvement | Score | WT SC | Driver Discipline Improvement | Score | WT SC | Vehicle Restriction Policy | Score | WT SC |
| 1. Will most quickly reduce congestion | 10 | Building new roads takes time | 6 | 60 | New systems can be introduced within a year | 8 | 80 | Changing bad driving habits will take time | 6 | 60 | Will have an immediate effect. Introducing policy should take 3-6 months | 10 | 100 |
| 2. Institutional capacity to implement | 9 | Capacity to implement is there though delays should be expected | 7 | 63 | Staff will need extensive training in new system | 7 | 63 | Police enforcers will need training and incentives to implement | 8 | 72 | Is probably the easiest option to implement | 9 | 81 |
| 3. Financial and economic viability | 8 | Most expensive option, many times the cost of other options | 5 | 40 | Can be expensive depending on software, hardware, and infrastructure required | 8 | 64 | Cost implications only relate to training of enforcers | 10 | 80 | Least cost alternative | 10 | 80 |
| 4. Social and political acceptability | 5 | Most 'visible' option and will give temporary relief to all | 10 | 50 | Will be appreciated because it will cause least disruption to introduce | 8 | 40 | Will be unpopular with drivers initially till they see the benefits | 5 | 25 | Will be difficult for people to accept. Some will be car-less on some days. A PR program required. | 4 | 20 |
| 5. Most widespread effect | 7 | Will only affect a few major arteries where expansion is possible | 4 | 28 | Can affect all major roads if implemented widely | 9 | 63 | Can affect whole metropolis if implemented widely | 9 | 63 | Will have widest and most immediate impact where introduced. | 10 | 70 |
| **Total: Index of performance** | | | | **241** | | | **310** | | | **300** | | | **351** |

The outcome of this analysis suggests that three of the four options are fairly closely balanced. The *Road Infrastructure Option* is the least preferred. The *Policy Option* has the highest return followed by *Traffic Management* and *Driver Discipline* options.

## Approaches to Selecting Solutions

De Graaf (1996) has identified a number of tools to help project designers take the step from analyzing data to identifying and selecting a solution from the alternatives available. All of these tools are designed as a group activity, and are a way of engaging stakeholders meaningfully in the project planning process.

- Brain storming allows creative ideas to emerge about possible alternative solutions and their respective value.

- Object Oriented Project Planning is a visual way to discuss situations and involves construction of problem trees and solution trees.

- Nominal Group Techniques is a process in which participants rank solutions according to their priorities.

- Ordinal Ranking is another process for ranking solutions by performing comparisons between pairs of alternative solutions. It is useful where issues are complex and ranking is difficult to perform.

- Force Field Analysis allows people to list advantages and disadvantages of each option and encourages people to think about implications, repercussions, and requirements of each solution.

- Valuation Techniques is an extension of Force Field Analysis in which participants weight advantages and disadvantages of each alternative solution.

- Multi-attribute Analysis and Utility-based Trade-off Analysis is the most sophisticated of all the methods. Rather than just listing advantages and disadvantages of each solution, people list the criteria according to which each option will be assessed and score each option according to those criteria.

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De Graaf, Martin. (1996). *Pre-implementation tools: Tools and challenges for donors in designing and preparing initiatives towards capacity development in the environment*. Supplementary paper for the OECD/DAC International Workshop on Capacity Development in Environment, 4-6 December 1996, Rome, Italy

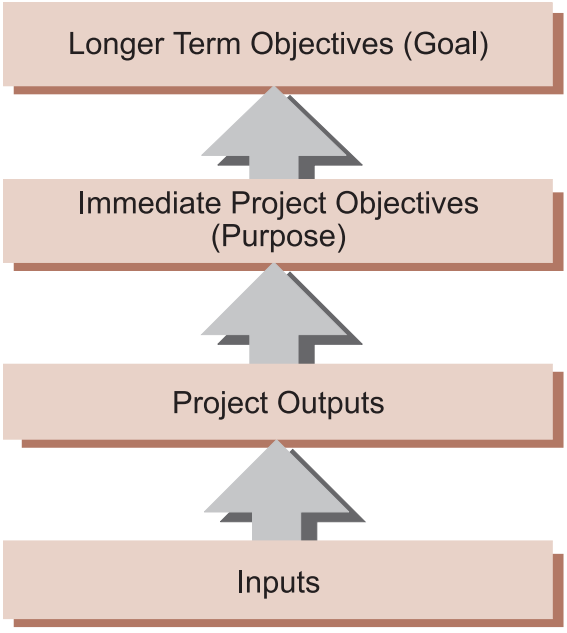
# Part 2: Project Design and Planning

Part 2 deals with the use of the logical framework for project planning and design. Core concepts underlying the logical framework are summarized as follows:

- The logical framework presents the key elements of a development intervention and their interrelationships. The intervention is usually termed a project or a program.
- The framework clearly identifies the impacts or objectives the project or program will achieve. It also allocates measurable and/or tangible performance targets to them.
- The framework also clearly identifies the inputs and outputs the project or program will deliver to enable achievement of the proposed objectives.
- Thus, the framework presents a cause and effect matrix where inputs lead to outputs and outputs lead to immediate objectives, which in turn lead to longer-term objectives. This cause-effect relationship is depicted in Figure 9.



**Figure 9: Cause-Effect Relationships in Project Design**



This cause-effect sequence is drawn substantially from the *cause-effect* analysis and related objectives tree described in the previous section. The alternatives analysis facilitates the choice of the cause-effect strand(s) that will make up the project intervention.

Making the cause-effect relationships between the basic elements of the project's design more explicit adds confidence that the project is realistic, implementable, monitorable, and capable of delivering the set objectives.

## Key Elements of a Logical Framework

There is a clear distinction between the logical framework process and the logical framework matrix. The process refers to the steps involved in planning and designing the project. These steps invariably include a situation analysis, stakeholder analysis, cause-effect analysis, objectives analysis, and alternatives analysis culminating in the design of the project. The matrix, which summarizes the final design of the project, usually comprises 16 frames organized under 4 major headings, as presented in Figure 10.



**Figure 10: Key Elements of the Logical Framework**

| Design Summary | Performance Targets | Monitoring Mechanisms | Assumptions & Risks |
|---|---|---|---|
| Goals | | | |
| Purpose | | | |
| Outputs | | | |
| Inputs | | | |

The **Design Summary** provides information on the basic building blocks of the project and presents them as a cause-effect chain drawn from a preceding cause-effect analysis. The *inputs* are expected to result in the *outputs*, which in turn are expected to achieve the immediate objective (sometimes called the *purpose*) of the project which contributes to the longer term objectives (sometimes called the *goals* of the project.)

Some logical frameworks include the category of *Activities*. This refers to the detailed and chronological tasks, which will use inputs and deliver outputs. If the logical framework is to be used as a detailed planning and implementation guide, the inclusion of Activities is necessary. If the logical framework is used to reflect a succinct logical presentation of the critical elements of a project or program, the inclusion of Activities is not essential.

The **Verifiable Performance Targets** tie down performance requirements for each element of the project design. These are specific tangible and/or quantifiable measures of achievement for each level in the design summary. These indicators are important in both monitoring and assessing success.

The **Monitoring Mechanisms** are the sources and/or methods, which will be used to collect data for monitoring performance at each level of the cause-

### Alternative Fomulations of the Logical Framework System

Although the logical framework system most commonly used is a matrix of 16 cells, there are some alternative formulations. These include:

- A training manual produced by USAID in 1980 described eight possible variations in the logical framework system such as additional columns for verifying assumptions and for specific quantified targets and additional rows for intermediate outputs and subsector goals.

- A training manual produced by FAO in 1986 with Activities as a row between Input and Output, creating a matrix with 5 rows and 4 columns.

- ZOPP replaced Inputs by Activities in the bottom row (GTZ, 1988). They saw activities as a crucial feature of the logical framework whereas inputs could be specified elsewhere in the project documentation.

- The NORAD matrix has only three columns - the middle column combines a description of indicators with the means of verification.

Although they differ in detail, these alternatives all maintain the matrix layout of the logical framework system as developed by PCI.

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USAID (1980). *Design and Evaluation of Aid-Assisted Projects*. Training and Development Division, Office of Personnel Management, U.S. Agency for International Development, Washington DC.

effect chain in the design summary. These must be specified because they often require resources and commitment from the project implementors.

The **Assumptions and Risks** identify other conditions, which are external to the project but are needed to ensure that one level indeed causes the next level of performance to happen. Thus, given the level of inputs, outputs will be produced *assuming* project staff have the required technical skills *(assumptions)* - and outputs will give us the expected impacts - *assuming* no major natural disaster takes place *(risks)*.

## Designing a Project using the Logical Framework

### Identifying the Project's Purpose and Goals

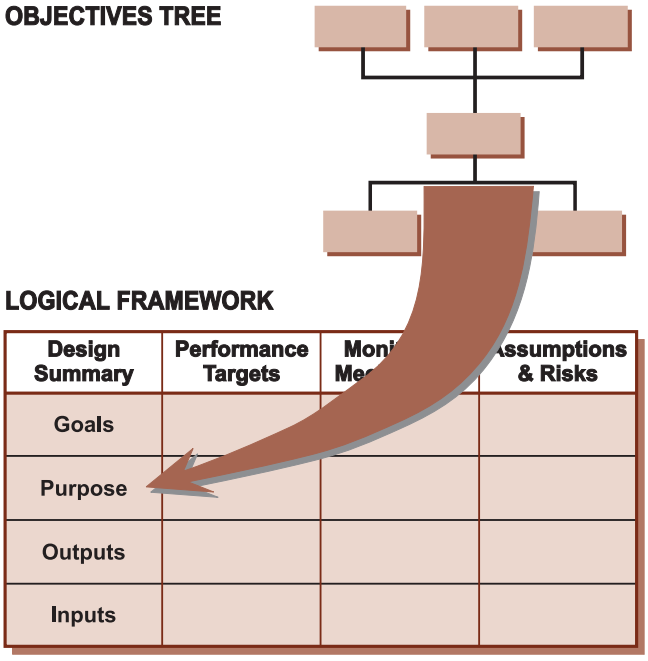
The Design Summary comprises four basic levels of a cause-effect chain. At the top are the project goals (the **long-term objectives of the project**). While these provide the umbrella logic and rationale for the project, they will only come on stream over the long term and are influenced by many variables in the interim.



The project purpose (the **immediate objective of the project**) is the key anchor of the project design. This is the level of achievement that the project must deliver. This objective should become evident by the end of the project implementation period. A project's scope and outputs will be designed around this objective to specifically ensure that it is achieved by the end of the project. It is therefore advisable to have only one immediate objective for the project.

Therefore, the **starting point** for preparing the logical framework must always be the immediate project objective or purpose (see Figure 11).

**Figure 11: The Starting Point in Formulating the Logical Framework**






In other words, we must first identify the central problem (or opportunity) and the immediate desired impact as precisely as possible. We must also specify the verifiable performance targets that we expect the project to deliver by the time it is complete. These should normally be predictable.

Thus, we begin with the "design summary" column, specifically the frame pertaining to the project purpose (i.e. the immediate objective). The related frames under the performance targets and the monitoring mechanisms are also completed in parallel. This is essential because the performance target/s forces the project designer to specify the immediate project objective and hence the expected immediate impact of the project. This must be done in tangible, measurable, and monitorable terms, ensuring that the designer also becomes clearly aware of what he or she wants the project to deliver. Note that there is only one immediate objective specified for the project. In Example 6, the core objective which has been identified in Example 4, becomes the Project Purpose.

***Example 6: Entering project purpose in the transport sector***

From the objectives tree analysis and alternatives analysis a project may be selected. This project must now be designed in detail. The first step is to identify and document the project purpose.

| Design Summary | Performance Targets | Monitoring Mechanisms | Assumptions & Risks |
|---|---|---|---|
| **Goals** | | | |
| | | | |
| **Purpose** | | | |
| • Reduced traffic congestion | • Increased traffic speed on major arteries from 12km/hr to 25km/hr in 3 years | • Daily reports from traffic monitoring system | |
| **Outputs** | | | |
| | | | |
| **Inputs** | | | |
| | | | |



The next step is to clarify the project goals **(longer-term objectives)** sought by the project. These are usually subsector or sector goals, but sometimes national goals are specified. Examples of goals include increased productivity, increased incomes, poverty reduction, and employment creation. In specifying the goals the cause-effect linkage between the purpose and the goal must be realistic.

The project purpose and project goals are written differently.

(a) While there may be more than one long-term objective or goal, there is usually only one main and primary immediate objective for each project. If there are to be more than one, this implies there are a number of subprojects under the umbrella of a more generalized project. This issue will be dealt with in the discussion on outputs and the implications of having more than one immediate project objective.

(b) While the immediate project objective is always tied down with a tangible and/or measurable performance target, this is not always necessary for the longer term objectives because the longer term objectives:
    - are expected at a much wider scope (e.g., the sector);
    - will accrue at a much later date (perhaps 5-10 years down stream); and
    - will be influenced by many factors other than this project.

Thus, establishing very specific long-term targets to be achieved by this project is not always realistic.



In defining the goals, several effects at various levels should be considered. Looking at the transport example, the next immediate effects of *smooth traffic flows* are *fuel conservation, time saving, reduced pollution,* and *longer life for vehicles*. Higher level effects are *increased current account, increased productivity, improved quality of life*, and *reduced costs*. There are also effects in between these two levels. Which of these effect(s) should be the long term objectives or goals of the project? How is this decision made?

The principles to be observed in selecting these goals should include the following:

- There should be a direct cause-effect relationship with the purpose.
- The purpose should make a reasonably significant contribution to the goal(s).
- If more than one goal is specified, there could be possible cause-effect relationships between them which the designer should be aware of.

By way of illustration, the highest order objectives in our example - *increased current account* and *productivity* - are considered too removed from *reduced traffic congestion*. Far too many other effects and external influences would intervene between reducing traffic and achieving these goals. Also, the project focuses only on one city.

The scope of the likely effects at a national level is therefore even further limited.

Several more immediate goals remain to be chosen. Which of the remaining ones are more important as likely follow-on effects of a reduction in traffic congestion? The two obvious ones are *time saving* and *fuel conserved*. Both can be readily measured, directly or indirectly, by traffic volume and traffic speed data.

*Reduced pollution* could also be an obvious objective for a government. However, how significant is vehicle pollution to the overall pollution levels in the city? Given these high levels, perhaps one should also consider reduced pollution as a goal. It can be regularly measured and has important follow-on effects. *Longer life for vehicles* is not adopted as a goal, largely because of the difficulties in its measurement and the many factors that contribute to vehicle deterioration.



Thus, at this stage of our design, we have three acceptable goals

- reduced pollution,
- fuel conservation, and
- saved travel time.

### *Example 7: Entering project goals in the transport sector*

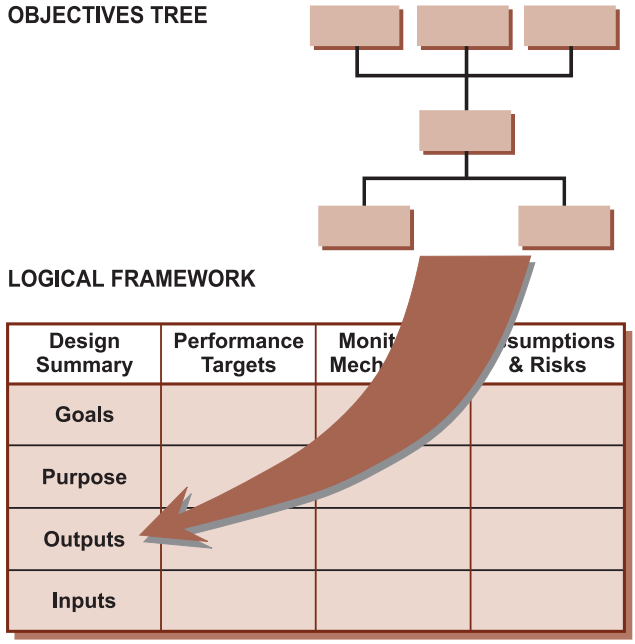
The next step is to identify the project goals.

| Design Summary | Performance Targets | Monitoring Mechanisms | Assumptions & Risks |
|---|---|---|---|
| **Goals** | | | |
| • Saved travel time<br>• Reduced pollution<br>• Fuel conserved | • Average journey time to work reduced from current 1 hour<br>• TSP, PM10, Lead levels within WHO guidelines<br>• Improved fuel consumption/ km | • Quarterly sample survey<br>• Quarterly field surveys<br>• Motor association surveys | |
| **Purpose** | | | |
| • Reduced traffic congestion | • Increased traffic speed on major arteries from 12km/hr to 25km/hr in 3 years | • Daily reports from traffic monitoring system | |
| **Outputs** | | | |
| | | | |
| **Inputs** | | | |
| | | | |

## The Project's Scope —Its Outputs

To determine how the objectives, both longer term and immediate, will be achieved by the project, examine the project's **"outputs,"** i.e. the physical and/or tangible goods and/or services to be delivered by the project (see Figure 12).

**Figure 12: Specifying Project Outputs in the Logical Framework**




Various types of physical or tangible goods and services may be financed and delivered by the project. The guiding principle should be that the outputs must provide the conditions necessary to achieve the immediate project objective. This cause-effect relationship between the project's outputs as a package and the envisaged objective is central to project design. This cause-effect hypothesis must be checked and verified because this is the basis on which investment will be made available to the project.

Project outputs potentially fall within the following categories:

(a) *Infrastructure Outputs*: These are the typical physical deliverables of projects and can range from a road to an energy plant, from schools and curricula

for children's education to a water supply system. They are usually physical deliverables necessary for achieving envisaged impacts.

(b) *Service-type Outputs*: These are outputs which may or may not accompany infrastructure support. They include services such as health care, agriculture extension programs, and research into new products or systems of operation.

(c) *Policy-type Outputs*: The policy and legal framework within a sector is critical to the effective and efficient functioning of that sector. The infrastructure or strengthened services provided by the project may often be ineffectual at delivering envisaged impacts unless supporting changes are made in sector policy.

Accordingly, a project may assume the responsibility for adjusting the policy or legal framework through the introduction of new policies or the strengthening of the legal framework to support delivery of sector impacts.

(d) *Institutional Strengthening-type Outputs*: These types of outputs can range from institutional diagnostic studies to the revision of operating strategies, the introduction of new operating systems, the upgrading of operating standards, the enhancement of staff skills, etc. Such strengthening is often necessary not just for the effective delivery of infrastructure and service outputs described above, but also for sustaining their functioning long after project completion.



In a typical project, the infrastructure, services, policy, and institutional strengthening outputs must complement each other.

Returning to the transportation example, there appear to be various possible options to reducing traffic congestion (refer to Example 4). The road infrastructure option (which involves a widening of the main arterials) is assessed as the least effective option to reducing congestion by the alternatives analysis in Example 5, and is therefore not included as an output. Road infrastructure can be a large expenditure item; the level of finance available is an important criterion for eliminating the infrastructure option. Ensuring effective maintenance of vehicles is logistically unrealistic. Thus, the viable options considered are: (i) improving the signal system; (ii) automating traffic monitoring; (iii) a new policy on vehicle restriction; (iv) improved enforcement; and (v) staff training.

When outputs are described in a design summary their performance targets and monitoring mechanisms should also be identified.

### *Example 8: Entering project outputs in the transportation sector*

At this stage defined outputs are needed for each of the other four areas of support.

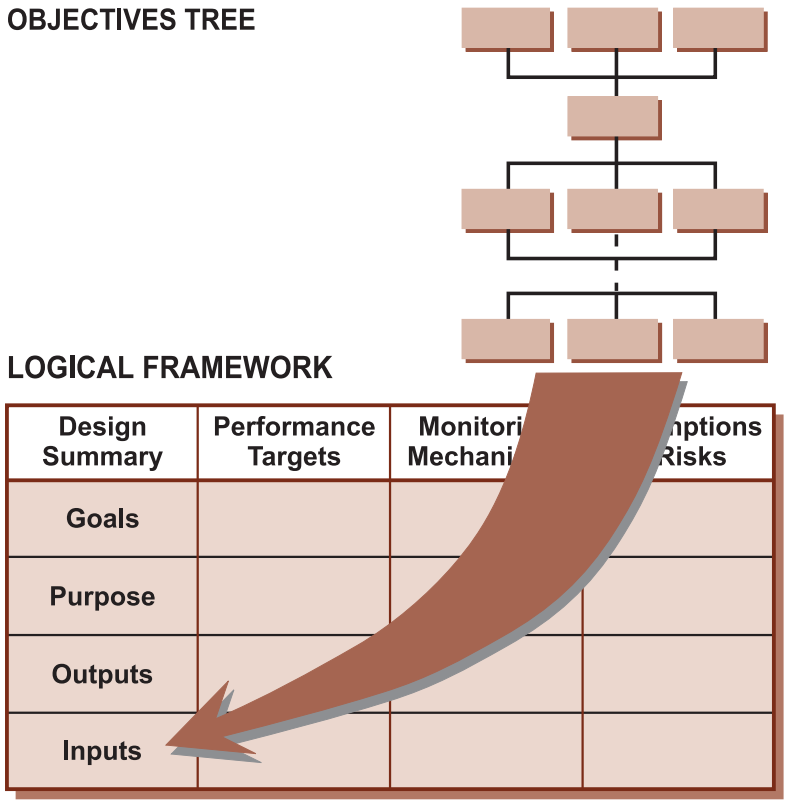
| Design Summary | Performance Targets | Monitoring Mechanisms | Assumptions & Risks |
|---|---|---|---|
| **Goals** | | | |
| • Saved travel time<br>• Reduced pollution<br>• Fuel conserved | • Average journey time to work reduced from current 1 hour<br>• TSP, PM10, Lead levels within WHO guidelines<br>• Improved fuel consumption/km | • Quarterly sample survey<br>• Quarterly field surveys<br>• Motor association surveys | |
| **Purpose** | | | |
| • Reduced traffic congestion | • Increased traffic speed on major arteries from 12km/hr to 25km/hr in 3 years | • Daily reports from traffic monitoring system | |
| **Outputs** | | | |
| • Automated traffic signal system upgraded and operating | • New and old signals operating by end of 2000. Downtime reduced by 10%. | • Project implementation progress reports<br>• Maintenance records of traffic authority | |
| • Automated traffic monitoring system installed and operating | • Installed by end of 1999<br>• Provides real time data for traffic management. | • Project implementation progress reports<br>• Traffic authority reports | |
| • Peak hour vehicle restriction scheme on major arteries | • Effective 1 January 1999<br>• Vehicle use drops by 20% by end of 1999 | • Traffic monitoring reports | |
| • Increased enforcement of traffic rules and regulations | • New fines system introduced 1 January 1999<br>• Traffic infringements drop by 30% by 1998 and stay level to end of 2000 | • Police reports | |
| • Trained staff in traffic management & enforcement | • Traffic Management & Policing Courses developed by mid 1999<br>• All traffic managers retrained by end of 2000<br>• Police trained in more effective policing and enforcement of regulations | • Project implementation progress reports | |
| **Inputs** | | | |
| | | | |

In summary, the project's objective provides a rationale and purpose, (why the project is being done). The project's outputs describe the physical and/or tangible deliverables, which will occupy all of the energies of the project implementors over a stated period. While the project outputs are the most visible component of project design, they should never become the primary preoccupation of the project. This must always remain the project's intended objectives. Thus, even during implementation, project staff have to continually remind themselves of the reason for the project and verify whether the envisaged linkage between the project's outputs and its objectives remain valid.

## Project Inputs

Project inputs are entered into the box in the lower left corner of the logical framework matrix (see Figure 13).

**Figure 13: Specifying Project Inputs on the Logical Framework**



Inputs generally fall within four main categories:

- consultants to plan and support implementation— included in this are costs associated with required surveys, detailed design and technical advice;
- equipment and software plus related staff training;
- civil works; and
- local salaries and project management.

Further subcategories of inputs can be developed as required. In the logical framework coverage of costs is only provided in a summarized manner. Detailed cost tables are available separately.

Similarly, the logical framework need not cover any information on activities. Detailed activity and implementation charts (GANTT charts or PERT/CPM drawings) are available with project documentation. The most important purpose of the logical framework is to summarize the key elements of the project's design rather than present self-contained and comprehensive project information.

### *Example 9: Example of project inputs in the transportation sector*

With project inputs added, the framework looks as follows:

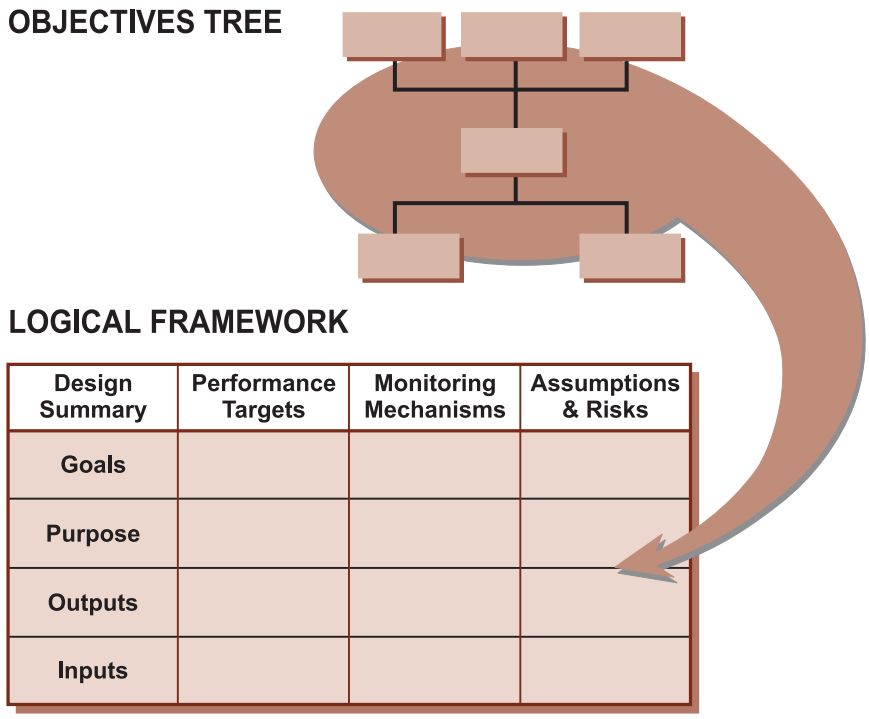
| Design Summary | Performance Targets | Monitoring Mechanisms | Assumptions & Risks |
|---|---|---|---|
| **Goals** | | | |
| • Saved travel time<br>• Reduced pollution<br>• Fuel conserved | • Average journey time to work reduced from current 1 hour<br>• TSP, PM10, Lead levels within WHO guidelines<br>• Improved fuel consumption/km | • Quarterly sample survey<br>• Quarterly field surveys<br>• Motor association surveys | |
| **Purpose** | | | |
| • Reduced traffic congestion | • Increased traffic speed on major arteries from 12km/hr to 25km/hr in 3 years | • Daily reports from traffic monitoring system | |
| **Outputs** | | | |
| • Automated traffic signal system upgraded and operating | • New and old signals operating by end of 2000. Downtime reduced by 10%. | • Project implementation progress reports<br>• Maintenance records of traffic authority | |
| • Automated traffic monitoring system installed and operating | • Installed by end of 1999<br>• Provides real time data for traffic management. | • Project implementation progress reports<br>• Traffic authority reports | |
| • Peak hour vehicle restriction scheme on major arteries | • Effective 1 January 1999<br>• Vehicle use drops by 20% by end of 1999 | • Traffic monitoring reports | |
| • Increased enforcement of traffic rules and regulations | • New fines system introduced 1 January 1999<br>• Traffic infringements drop by 30% by 1998 and stay level to end of 2000 | • Police reports | |
| • Trained staff in traffic management & enforcement | • Traffic Management & Policing Courses developed by mid 1999<br>• All traffic managers retrained by end of 2000<br>• Police trained in more effective policing and enforcement of regulations | • Project implementation progress reports | |
| **Inputs** | | | |
| • Consultants<br>• Equipment and software<br>• Civil Works<br>• Salaries/Others | • Consultants $ 5 mn<br>• Equipment and software $ 20 mn<br>• Civil Works $ 30 mn<br>• Salaries/Others $ 5 mn<br>Total: $ 60 mn | • Project implementation progress reports<br>• Project accounts | |

## Assumptions

Having determined the inputs, outputs, purpose, and goals of the project, one has in fact specified the hypotheses for the success of the project. All hypotheses have assumptions and risks. The task now is to define the specific assumptions and risks underlying the proposed project design.

Assumptions are factors, which are outside the control of the project but which nevertheless influence the cause-effect relationships integral to project design. This is shown in Figure 14.

**Figure 14: Mapping of Assumptions in the Logical Framework**

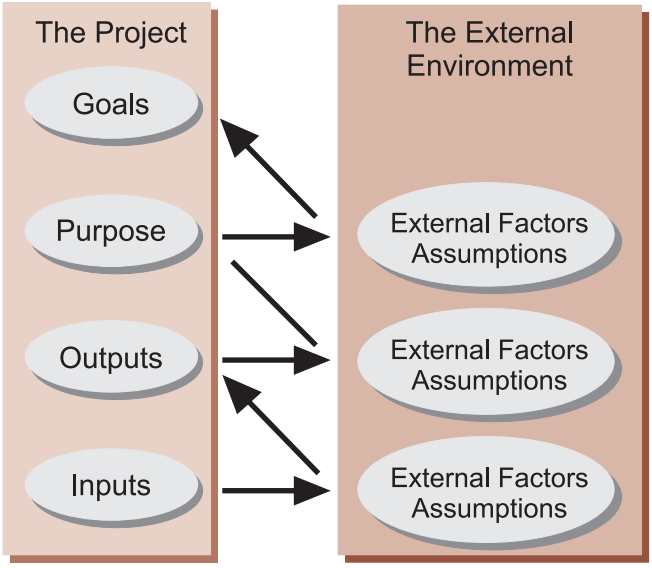



The achievement of the project's purpose will indeed result in the achievement of its goals if certain external factors/conditions exist. These are the assumptions. From another point of view they are the project's risks. If these conditions, which are usually not within the control of the project, are not present, the project's objectives may be difficult to achieve.

The concept of assumptions applies at all levels of the project design summary. The achievement of the project's outputs will result in the achievement of its purpose only if the external assumptions prevail. Similarly, the project inputs will translate into the project's outputs only if certain other conditions exist.

Such external factors may range from the level and timeliness of rainfall needed for crop production to the political support required to pursue and implement a policy reform program.

**Figure 15: Assumptions about the External Environment**




Typical areas in which assumptions influence the outcomes of projects include:

- market conditions/prices
- macroeconomic policies/conditions
- political and social conditions
- sector policies and conditions
- environmental conditions
- private sector capability
- government administrative capability
- community/NGO support
- counterpart funding.

Assumptions can also be written as risk statements. For example, a new seed variety distributed by a project (output) will result in increased crop production (immediate impact) on the assumption that the monsoon rain will be timely and adequate.

If this assumption is worded as a risk it would be formulated as follows:

**If** *monsoon rain does not come on time and in adequate quantities,* **then** *crop production will not increase as expected.*

When looking at assumptions as risks we must always consider both facets of the risk: its probability (*if*) as well as the seriousness of its consequence (*then*) if it occurs. Only risks and assumptions, which may adversely influence the project, need to be considered.

## Options for dealing with Assumptions

*Do nothing*: This is certainly one option. It is probably the best option if none of the assumptions and risks are serious enough to endanger the achievement of the project's objectives.



*Change the project design*: Sometimes the easiest way of dealing with an assumption or risk is to go back to the project design and add outputs and/or inputs to address the assumption or risk. For instance, the important hypothesis that inputs will result in outputs assumes the capability of the executing agency to use the inputs efficiently and effectively. If the agency does not have full capability to do so, it would be wise to add an institutional capacity building component to the project to address this risk.

*Add a new project*: This sometimes becomes necessary. For instance, an assumption in achieving increased rice production is that sufficient rain will fall. If the seasonal fluctuation seems too high, it may be necessary to initiate a parallel program to provide for additional water resources as a contingency resource to bridge short periods of drought.

*Abandon the project*: Sometimes, when the risk is too great and the preventive or contingency measures too expensive or difficult to undertake, the wisest course of action is to abandon the project.

### *Example 10: Entering assumptions in the transportation sector*

Adding assumptions and risks completes the framework:

| Design Summary | Performance Targets | Monitoring Mechanisms | Assumptions & Risks |
|---|---|---|---|
| **Goals** | | | |
| • Saved travel time<br>• Reduced pollution<br>• Fuel conserved | • Average journey time to work reduced from current 1 hour<br>• TSP, PM10, Lead levels within WHO guidelines<br>• Improved fuel consumption/km | • Quarterly sample survey<br>• Quarterly field surveys<br>• Motor association surveys | |
| **Purpose** | | | |
| • Reduced traffic congestion | • Increased traffic speed on major arteries from 12km/hr to 25km/hr in 3 years | • Daily reports from traffic monitoring system | • Traffic growth stays at or below 5% per year |
| **Outputs** | | | |
| • Automated traffic signal system upgraded and operating | • New and old signals operating by end of 2000. Downtime reduced by 10%. | • Project implementation progress reports<br>• Maintenance records of traffic authority | • Traffic authority is capable of managing |
| • Automated traffic monitoring system installed and operating | • Installed by end of 1999<br>• Provides real time data for traffic management. | • Project implementation progress reports<br>• Traffic authority reports | |
| • Peak hour vehicle restriction scheme on major arteries | • Effective 1 January 1999<br>• Vehicle use drops by 20% by end of 1999 | • Traffic monitoring reports | • City mayors will accept and enforce the scheme despite public protests |
| • Increased enforcement of traffic rules and regulations | • New fines system introduced 1 January 1999<br>• Traffic infringements drop by 30% by 1998 and stay level to end of 2000 | • Police reports | • Traffic enforcers are given adequate incentives to implement effectively |
| • Trained staff in traffic management & enforcement | • Traffic Management & Policing Courses developed by mid 1999<br>• All traffic managers retrained by end of 2000<br>• Police trained in more effective policing and enforcement of regulations | • Project implementation progress reports | • Training is appropriate, effective and implemented |
| **Inputs** | | | |
| • Consultants<br>• Equipment and software<br>• Civil Works<br>• Salaries/Others | • Consultants $ 5 mn<br>• Equipment and software $ 20 mn<br>• Civil Works $ 30 mn<br>• Salaries/Others $ 5 mn<br>Total: $ 60 mn | • Project implementation progress reports<br>• Project accounts | • Consultants are competent.<br>• Local contractors are competent.<br>• Counterpart budget is available on a timely basis.<br>• Counterpart staff are available. |

## Verifiable Performance Indicators: The Link between Project Design and Project Implementation

### *Using Performance Indicators to Specify Performance*

Verifiable performance indicators (VPIs) are measures used to establish the accomplishment of inputs, outputs, purpose, and goal(s) of a project. VPIs indicate in specific, measurable, and/or tangible (and therefore monitorable) terms the performance to be achieved at each level in project design. In effect, they clarify the minimum achievement requirement for inputs to cause the outputs and for the outputs to cause the envisaged impacts.

VPIs should also be used to specify and monitor the risks/assumptions and the extent to which these hold true or change during project implementation.

When identifying and specifying VPIs remember: *if we can measure it, we can manage it*. Thus, in defining VPIs for a project, designers are forced to clarify what various objective-type statements used to describe the outputs and impacts of the project mean. VPIs help to remove vague and imprecise statements about what can be expected from our project interventions.



VPIs should measure results, not just processes, and if possible they should identify these results in terms of all of the following dimensions:

- the expected quantities to be achieved;
- the expected quality standards to be achieved;
- the time period over which the quantitative and qualitative achievements will occur; and
- the location/area of achievement.

Thus, each indicator must specify a target in terms of quantity, quality, time, and location (if relevant).

For the indicator to measure change it must have a baseline as a reference point. This is usually current performance of the entity and/or of a comparator at the beginning of a project. Performance during project implementation is measured against the target, taking into account the baseline as well as expected improvements above it.

Keep the number of indicators to the minimum. Use only those performance indicators that are needed to determine whether the objective is accomplished.

Performance indicators should always be developed at the same time as the specification of the project design summary, viz, the project's goals, purpose, outputs, and inputs. The performance indicators and related targets test the realism of the project's design at each level.

*Goal(s)*

Performance indicators at this level are the long-term impacts expected from the project, and in this sense they are not project specific. Rather, at this level they are program, subsector, or sector objectives to which this particular and several other projects will contribute.

Ensure that the project's goals and related performance indicators or targets are realistic. The project should have reasonable potential in contributing to the achievement of its goals, though this may be only in the longer term.

The performance indicators for monitoring success in achieving the goal of *reduced pollution* in the transportation sector are shown in Table 3.



**Table 3: Goal Performance Indicators**

| Item | Performance Indicator |
|---|---|
| • indicator to be measured | • *Reduced concentrations of TSP, PM10 and lead.* |
| • the expected quantitative changes in performance | • *Concentrations reduced from existing levels to WHO standards.* |
| • the quality standard to be achieved | • *Concentrations maintained at WHO standards.* |
| • the time period over which the change in quantity and quality is to occur | • *Concentrations reduced to WHO standards by 2005 and maintained thereafter.* |
| • the location/area of achievement | • *Concentrations in metropolitan areas to be reduced to WHO standards by 2005 and maintained thereafter* |

*Purpose*

Performance indicators and related project targets at this level are most crucial and can sometimes be difficult to determine. They are the performance targets for which the project takes full accountability to deliver. They are the performance measures by which the project will be judged a success or failure.

The purpose or end-of-project impact defines the project's immediate impact on beneficiaries or institutions and related changes in the behavior of project beneficiaries and institutional functioning.

In the transportation example, the immediate purpose or objective of the project must be: reduced traffic congestion. Thus the performance indicator and related target is specified as: average traffic speed on major arterial roads is increased from 12 km/hr in 1998 to 25 km/hr in 2003.

The purpose should be stated as simply as possible to ensure its feasible achievement and ease of monitoring. This is not to say that we should simplify the objective so that it can be easily achieved. The achievement of the purpose depends on the successful achievement of the various outputs. Thus the outputs will be defined in relation to the purpose level objective and related indicators.



*Outputs*

The outputs are usually the easiest to specify in terms of performance indicators and targets, because outputs are the tangible goods and services to be delivered by the project. All outputs have to be accomplished by the end of the project's implementation period.

*Inputs*

These are the resources available for project implementation. Inputs are usually money (budget); equipment; technology; and human resource expertise.

Performance indicators and targets may be altered after they have been established. Adjustments are possible and sometimes advisable during implementation to accommodate changes in the circumstances of the project. Changes may also be necessary due to deficiencies in data availability on the performance indicator. Therefore, indicators and targets should be periodically re-examined

and refined if necessary to provide the most up-to-date measure of the project's performance.

### *Using Performance Indicators to Manage, Monitor and Evaluate Performance*

VPIs provide a basis for monitoring and evaluating the project. To serve this function, performance indicators must be integrated into the *management information system* of the project and/or of the institution or executing agency.

The *monitoring mechanisms* are the data sources and reporting systems that will be used to verify the status of each indicator. They will show what is accomplished with respect to inputs, outputs, purpose, and goals of the project. The monitoring mechanisms and the information system will provide the evidence that the objectives have been achieved.

The indicator and the monitoring mechanism must be determined together to ensure that the monitoring mechanisms and information systems are practical and cost-effective.

In determining the monitoring mechanism for a particular performance indicator it is necessary to consider the following:

- Is the data available from normal sources?
- How reliable is the data?
- Is the data available on a timely basis?
- If special data has to be collected, what will it cost?

Definitions of performance indicators should be realistic, practical, and precise. The data collection effort should be cost-effective in meeting the needs of various decision-makers. Moreover, the need for data collection, using existing sources of information, has to be matched by the capability of the various agencies that would generate and report the information. Also, those who use it for decision-making should assess the need, comprehensiveness, and value of data.

If an indicator cannot be verified, then another indicator should be found.

### *Monitoring Assumptions*

Monitoring assumptions is critical to project success. The environment is continually influencing the cause-effect hypotheses on which the project is

built. Project implementors must ensure that such hypotheses continue to remain valid.

Monitoring should be built into the project's performance monitoring and management system. The project's performance indicators should be regularly monitored, and the assumptions on which they are built should be frequently checked and verified.

# Part 3: Management Information Systems

## Performance Management

Effective performance management requires the ongoing monitoring of the progress of a project towards the achievement of specified objectives. Included is the regular reporting of results to decision-makers to amend or improve performance. In performance management, measure what the project has achieved, not simply what it has completed.

To effectively manage project performance, the manager requires indicators that are simple to understand, easy to measure, and for which information can be collected and processed in a timely manner. Management needs an efficient and effective management information system (MIS) that works as an early warning system for potential problems. At the same time, the system should also measure the level of achievement of the project at input, output, purpose, and goal levels.



Too often in development projects, separate monitoring and evaluation systems are established independently of existing systems within the executing or implementing agencies. The argument for this approach is that the project requires special information, which cannot be gathered through the existing system.

However, the substantial amount of information collected by such monitoring and evaluation units often remains unprocessed; or if it is processed, it may not be delivered in a form useful to management or may be too late to be an effective input to decision making.

## Management Information Systems

The essential elements of an efficient and effective MIS are as follows:

- Information requirements for managing projects must be incorporated into the existing system of an executing or implementing agency.
- Information collected must indeed measure the level of achievement at the input, output, purpose and goal levels.
- The information must be accurate, timely, and cost effective.
- Management must be able to easily interpret information for use in decision-making.

Monitoring is concerned with both the efficiency and effectiveness of project implementation. Specifically, it is concerned with assessing how efficiently inputs are translated into outputs. This form of input-output monitoring focuses on the availability of project resources and the use of these to achieve outputs. The transition from outputs to purpose is often referred to as effectiveness, that is, the ability of the resources and outputs to achieve the purpose of the project. This level of monitoring is even more critical since the value of the project investment is in achieving the project impacts.

Project evaluation focuses on the achievement of the project's purpose and goals. It is conducted after the completion of project implementation.

Several MISs might be involved in providing the information needed to manage the performance of a particular project, particularly if several agencies are involved. Each agency will collect data to identify its own contribution to the achievement of the various inputs, outputs, purpose, and goal. Ideally these should be integrated into one MIS for the project.

The MIS for the project must provide an early warning system to project management about potential problems. It may also suggest possible ways to improve the overall project.



The executing agency or agencies are usually most interested in the indicators reflecting the use of inputs, and the achievement of outputs. Planning agencies and donors, while also interested in these VPIs, are probably more interested in the VPIs at the output, purpose and goal levels. It is their business however, to encourage existing agencies to place equal emphasis on monitoring impacts as well.

While it is of vital importance to monitor the VPIs closely at each level of the cause-effect hierarchy, it is equally important to monitor the risks/assumptions of the project environment. Therefore, the project's MIS must also provide for monitoring and reporting on these external variables.

Given that project planners must make assumptions about projects at the planning stage, the operational plan for a project must allow for incorrect assumptions. This can be done by

- highlighting key assumptions to monitor during the course of the project,
- suggesting ways of ensuring that an assumption turns out to be correct,
- indicating how the validity of the assumption can be monitored, and
- suggesting what action to take if an assumption is proving invalid.

# Part 4: Questions Often Asked About the Logical Framework

The logical framework has had a checkered history, falling in and out of favor of development planners and managers over the last 20 years. It is therefore not surprising that varied opinions and questions exist on the value of this process tool for designing and managing the development process. Below are some of the typical questions or objections raised about the use of the logical framework, and related answers.

*Isn't the logical framework a "blueprint" approach to the design of projects? As such, is it not more suited to infrastructure projects rather than process-oriented ones?*

All that the logical framework does is to encourage project and program designers to clarify their goals, purposes and outputs in as precise a manner as possible. It does not preclude the possibility of these goals, purposes and outputs changing over the course of project implementation due to changing external circumstances. When this happens, project managers need to re-examine the hypotheses on which the logical framework design of the project is built and accordingly adjust it to the changed circumstances. In fact, because the logical framework makes explicit the hypotheses and assumptions behind the design of projects and programs, it is easier to adjust the project's design.



Another important issue to remember is that even for process-oriented projects, it remains essential to be clear about the end objectives of the process; this justifies the investment. The logical framework helps clarify these end objectives in quantifiable and monitorable ways.

*Doesn't the logical framework, with its emphasis on the analytical basis of project design, work against the process of participation?*

In fact, the logical framework provides a valuable tool for encouraging substantive and meaningful participation of all key stakeholders in project design and implementation. Stakeholders such as beneficiaries can easily be involved in analyzing sector problems or opportunities, using the cause-effect tree that is a simple but effective method for making explicit the variables influencing a problem.

The use of this systematic methodology with all concerned stakeholders improves communication and dialogue between them about the problem and their preferred solutions. Every project designer should be developing cause-effect trees of issues being analyzed, with all key groups of stakeholders to help arrive at consensual courses of action.

*What are the common problems faced by project designers in developing a logical framework?*

The most common and difficult issue is identifying, in tangible and monitorable ways, the intended immediate objective of the project, or its purpose, and ensuring the project takes accountability to deliver it. This is the most important element of the logical framework and the most difficult to address. Project designers are in the habit of identifying a wide variety of "project objectives" which the project will supposedly deliver at some future point of time. These are usually couched in general terms such as *increased productivity*, *improved quality of life*, *reduced poverty* etc. In most cases, these objectives are never tied down to quantifiable and monitorable indicators. And rarely are distinctions made between objectives which the project will definitely deliver on completion and those which it can, at best, only influence in the longer term. The logical framework is a powerful tool to help make these critical distinctions. The project should really only take responsibility to deliver its immediate impact/s - those over which it can have complete influence. Thus, a water supply project can and should take responsibility to provide *access to drinking water*. It cannot and should not take responsibility to ensure *improved health*, though this is certainly one of the longer-term objectives it hopes to influence. Many variables other than water availability influence this longer-term objective.



Another key problem project designers encounter in preparing the logical framework is giving inadequate attention to the identification of assumptions and risks. These are elements outside the control of the project, but which influence the hypotheses on which the project design is built. It is critical to systematically identify these assumptions, monitor them, and take preventative actions whenever possible. Thus a key assumption in the traffic flows project described in the text is that vehicle growth will continue at below 5% a year. This is a critical assumption and needs to be monitored regularly so that appropriate preventive or contingent measures can be taken so that the benefits of project investment are preserved.

## Problems with the Logical Framework System

MacArthur (1994) has identified the following problems with the logical framework system:

- Precise description of a project leads to inflexibility in project design.

- Precise description of a project depends on using objectively verifiable indicators. These are easier to collect from "official" sources of data than from the general population. Thus, project designers tend to focus on economic indicators rather then people's experiences, and they tend to ignore qualitative data in favor of quantitative data. This may distort project design.

- The project framework system is neutral because it does not encourage project designers to take into account the points of view of all stakeholders. Again, this may distort project design by allowing project designers to ignore the views of some stakeholders.

- Project designers tend to complete the logical framework as the final step in project appraisal (after the project has been designed).

- Some project designers treat assumptions too superficially. As a result, they do not develop contingency plans for dealing with problems that arise during the project implementation.

- The Goals and Purpose categories may be filled with too much detail.

*Some solutions MacArthur suggests are as follows:*

- Encourage project designers to enter the "inputs" from various stakeholders as "Assumptions" to highlight the fact that project success depends on participation from all stakeholders.

- Design projects to be process oriented rather than as a blueprint. This will involve setting times for periodic reviews of the project within the project plan. It will also involve constructing a series of project frameworks to reflect the new circumstances that unfold during the life of a project.

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MacArthur, John D.(1994). The logical framework: A tool for the management of project planning and evaluation. *The realities of managing development projects*. Farhad Analoui (Ed). Aldershot, Hants, England. pp 87-113.

*Can a logical framework have more than one "purpose"?*

Yes it can, though preferably it should not. The hypothesis is that the identified set of outputs will deliver the stated purpose or immediate objective. If a second purpose is identified for the project, it will be necessary to provide for a second set of outputs, which will deliver this second purpose. In effect, therefore one has two projects under the garb of a *mother* project. This can be done as long as the critical relationship between the outputs and purpose is made clear.

*Is it not wiser to develop the logical framework after the project is designed to serve as a summary of the project for decision-makers?*

The logical framework is more than just a summary of the project's design. It reflects the logic and hypotheses on which the project is built. It is not only a thinking process but also a participatory process, allowing for the incorporation of the views of stakeholders. As such, it must be used as a design tool from the beginning rather than simply as a summarizing method.